

State of New Jersey Nonpoint Source Report 2007 Update April 2007



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State of New Jersey

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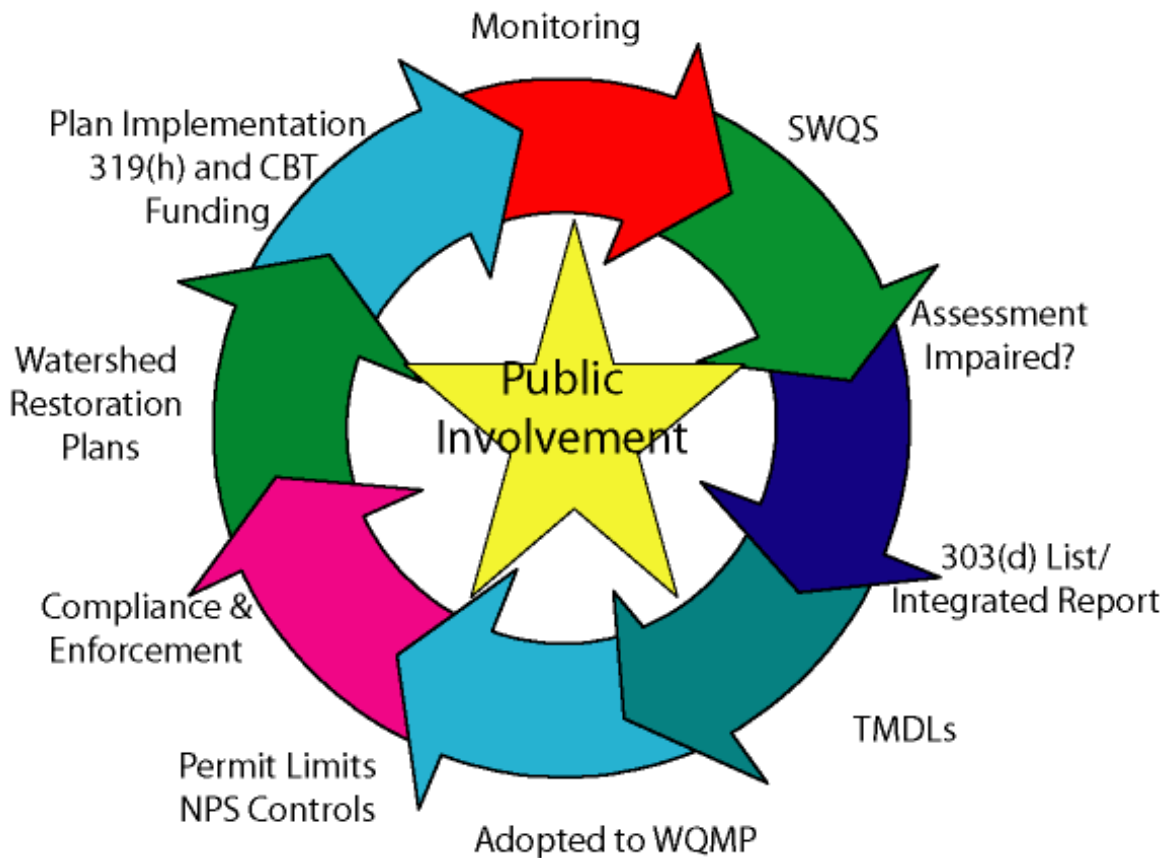
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INTRODUCTION

This publication serves as a 2007 Update to the 2004-2006 State of New Jersey Nonpoint Source Report. The New Jersey Department of Environmental Protection (Department) is the Executive Branch Agency charged with the formulation of comprehensive policies for the conservation of the natural resources of the state, the promotion of environmental protection and the prevention of pollution of the environment of the state (see N.J.S.A. 13:1D-9). Among the Department of Environmental Protection's water resource goals is the restoration and maintenance of the chemical, biological and physical integrity of New Jersey's surface waters and the attainment of fishable and swimmable water quality in those surface waters.

Integral to achieving these water resource goals, the implementation of the Department's Total Maximum Daily Loads (TMDLs) and Watershed Restoration Plans, which have been approved by the United States Environmental Protection Agency's (USEPA) Region 2, have resulted in marked increases in pollutant loading reductions. Grants Reporting and Tracking System (GRTS) entries for the projects that performed implementation work during federal fiscal year (FFY) 2006 illustrate the results: Total suspended solids (TSS) reductions increased from 86.1 tons/yr in 2005 to 890.5 tons/yr in 2006. Phosphorus reductions increased from 85.3 lbs/yr to 2,749 lbs/yr, and nitrogen reductions increased from 455.1 lbs/yr to 13,580.2 lbs/yr for the same period. These are excellent outcomes and they illustrate the culmination of the regulatory and voluntary cycle that the Department follows in its efforts at achieving its water resource goals as well as a shift from Watershed Restoration Plan development to plan implementation.

The picture below illustrates this cycle. Surface Water Quality Standards (SWQS) are established, and water bodies that do not meet these standards are added to the List of Impaired Waters. TMDLs are then established for these impaired waters, which subsequently get adopted as amendments to the area-wide Water Quality Management Plans (WQMPs). Out of the TMDLs come permit limits for dischargers as well as the implementation of nonpoint source control measures. If necessary, Compliance and Enforcement get involved dealing with violators and in the meantime, watershed restoration plans get developed, which also implement the TMDLs. 319(h) and Corporate Business Tax (CBT)-funded projects implement the restoration plans, with subsequent monitoring to see what improvements have been made in water quality and to see if the water body is still impaired, in which case, the cycle begins again.



The Federal Clean Water Act makes a clear distinction between point source and nonpoint source pollution and authorizes issuing National Pollution Discharge Elimination System (NPDES) permits for point source discharges. Under the Federal program, nonpoint pollution is addressed through non-permit mechanisms. However, the New Jersey State Water Pollution Control Act does not limit issuance of permits to point sources, and subsequently the Department also issues permits that control nonpoint sources of pollution, through authority of the New Jersey Pollution Discharge Elimination System (NJPDES) rules.

Water Quality

New Jersey, the fifth smallest state in the nation, contains a wide variety of water resources, geologic characteristics and natural biota and fauna. Within the state's 7,840 square miles are 127 miles of coastline; 15,000 miles of rivers and streams; and 69,920 acres of lakes and ponds that are larger than 2 acres. In addition, there are 1,482 square miles of fresh and saline marshes and wetlands, and 1,069 square miles of coastal waters. New Jersey has adopted Surface Water Quality Standards (SWQS), N.J.A.C. 7:9B, to protect these water resources.



The Surface Water Quality Standards establish the designated uses to be achieved and specify the water quality criteria necessary to protect the state's waters. To view New Jersey's Surface Water Quality Standards, go to www.state.nj.us/dep/wms/bwqsa/swqshome.html.

The biennial United States Environmental Protection Agency (USEPA) reporting requirements of the Statewide Water Quality Inventory Report or "305(b) Report" and the List of Water Quality Limited Waters or "303(d) List" are satisfied in the New Jersey Integrated Water Quality Monitoring and Assessment Report (Integrated Report). To view the Integrated Report for 2006, go to www.state.nj.us/dep/wms/bwqsa/generalinfo.html.

RESTORATION

New Jersey's commitment to restoring its watersheds and water quality include the issuance of NJPDES permits including effluent limits for point sources and requiring stormwater best management practice (BMP) implementation for nonpoint source pollution control, the development of TMDLs and restoration plans for impaired water bodies, and the implementation of these plans including on-the-ground projects funded through the federal 319(h) and 604(b) Grant Programs and State Corporate Business Tax Watershed Funds. This year they have resulted in enormous pollutant loading reductions in the Grants Reporting and Tracking System (GRTS). These results would not be possible without ongoing partnerships and leveraging of resources with the New Jersey Department of Agriculture, the Natural Resources Conservation Service and the State Soil Conservation Committee, local governments and numerous local watershed groups.

The emphasis of this Department's restoration efforts has shifted from restoration plan development to implementation. As discussed in the Introduction section of this report, this shift is evident in the enormous increase in GRTS-reported pollutant load reductions from FFY 2005 to FFY 2006. Also highlighting implementation are New Jersey's success stories for the reporting period, beginning on page 8.

TMDLs

Development

The state is required to establish total maximum daily loads (TMDLs) for all impaired waters (303(d) listed or 305(b) sublist 5 in accordance with a priority ranking. To ensure New Jersey meets its obligation to restore water quality to impaired water bodies, EPA Region 2 and the Department signed a Memorandum of Agreement which established a deadline of March 31, 2011 to address all impairments listed on the 1998 list.

This year, New Jersey established 46 TMDLs, all NPS related. Since 2000, New Jersey has established a total of 332 TMDLs, 325 of which were for impairments where nonpoint sources are the predominant problem. The table in Appendix I summarizes TMDLs that have been approved by EPA. New Jersey continues to meet the schedule for TMDL development.

Implementation

Significant load reductions from nonpoint sources are needed in order to attain water quality criteria and designated uses. Each TMDL includes an implementation plan, which identifies a suite of completed, on-going and planned activities needed to achieve the identified load reductions. In many cases, the completed and on-going projects have been made possible through EPA 319(h) grant awards. This funding is used in conjunction with state CBT funds, other federal funds (EQIP, CRP and CREP), and local

funds to address nonpoint sources of pollutants. New Jersey will continue to rely on 319(h) funding as a key element for accomplishing NPS reductions through TMDL implementation and thereby restoring water quality and designated uses.

Future Efforts

The Division of Watershed Management is also currently developing Stormwater and Stormwater Pollutant TMDLs, which will address biologically impaired sites listed on Sublist 5 of the biennial Water Quality Inventory Report. Nonpoint source pollutant loadings and the stormwater runoff that transports them are believed to be a driving force in the degradation of aquatic communities and their habitats. In order to develop empirical data to inform non-point source TMDL development, the Nonpoint Source Storm-Monitoring Study was performed. This multi-year surface water quality investigation conducted by the USGS NJ Science Center and the NJDEP-Water Monitoring & Standards Element, was designed to estimate the NPS loads of nutrients, bacteria, and suspended solids from various land use areas in Watershed Management Area (WMA) 17, 18, and 20. The study objectives were to (1) document current water quality before NPS and stormwater management strategies were initiated, and (2) develop a water quality model to estimate unit NPS loads of selected constituents associated with different lands uses in WMA 17, 18, & 20. Recently developed and innovative modeling applications will be used to identify a suite of hydrologic indicators that most strongly correlate with these impairments, in order to promote the most effective remediation plans, for example, stormwater best management practices (BMPs), to reduce runoff and minimize nonpoint source pollution.

The Water Monitoring & Standards Element, in cooperation with the Division of Watershed Management, also recently initiated the Stressor Identification Program pilot, to identify the principal stressors of impaired aquatic communities in the state's waterways. Studies are presently underway in three watersheds (Drakes Brook, Beaver Brook and Holland Brook). This pilot program is expected to produce a refined investigative methodology that can eventually be used statewide to identify aquatic community stressors. Initial results give some indication that nearsite stormwater discharges may have a dominant role in the identified degradation of stream biota and their habitat.

Nonpoint Source Program Activity Measures

The EPA has created Program Activity Measures (PAMs) for all states to report progress and document the success of their nonpoint source pollution control programs. PAMs 1-5 below articulate the federal reporting requirements and New Jersey's progress to date for the reporting period.

PAM 1: Waterbodies identified by the State of New Jersey (in 2000 or subsequent years) as being primarily nonpoint source-impaired that will be partially or fully restored (cumulative).

Although there is much more work to be done, New Jersey continues to be a leader in environmental protection through ground-breaking legislation; partnerships with other state agencies, watershed associations, volunteer monitoring groups, and local government agencies; and on-the-ground implementation of watershed restoration plans and TMDL implementation plans. But because the nature of stream restoration is a long-term process with tangible results demonstrated through monitoring taking possibly many years to manifest, we can not yet provide for EPA a hard number of waterbodies identified by the State of New Jersey as being partially or fully restored as a direct result of 319(h) project implementation. What we can provide is the number of delistings in 2006 as a whole: 630; and the number of delistings that were previously listed on Sublist 5 of pollutants commonly associated with nonpoint source pollution such as pathogens, pH, phosphorus, dissolved oxygen and temperature: 49. The latter 49 delistings are outlined in Appendix II of this report. For a complete list of the total waterbodies delisted in 2006 go to:

www.state.nj.us/dep/wms/bwqsa/docs/2006AppendixCDelistedWaters.pdf.

Given the work described above, and the progress reported in the sections below, we fully expect to achieve water quality improvements short-term and ultimately restored water bodies in the long-term future as we continue to implement watershed restoration and protection plans and TMDLs through the NJPDES Municipal Separate Storm Sewer System (MS4) program, Wastewater Management Planning program, the 604(b) grant program, and 319(h) and CBT watershed funding programs. Restoration and protection also depend on continued enforcement of the Stormwater Management and Water Quality Management Planning rules; work with stakeholder groups and other partners, and outreach and education across the State of New Jersey. In addition, the three national estuary programs have funding available for implementation projects that address habitat and water quality restoration projects, and endorse those projects that enhance our NPS program efforts and priorities.

This PAM will also be addressed through New Jersey's implementation of the EPA's "2006-2011 Strategic Plan: Charting Our Course, EPA, September 29, 2006" (for more information, see <http://www.epa.gov/ocfopage/plan/plan.htm>). Below is an excerpt from the Strategic Plan.

Goal 2: Clean and Safe Water

"Ensure drinking water is safe. Restore and maintain oceans, watersheds, and their aquatic ecosystems to protect human health, support economic and recreational activities, and provide healthy habitat for fish, plants and wildlife."

Objective 2.2: Protect Water Quality

"Protect the quality of rivers, lakes, and streams on a watershed basis and protect coastal and ocean waters."

Subobjective 2.2.1: Improve Water Quality on a Watershed Basis

"By 2012, use pollution prevention and restoration approaches to protect the quality of rivers, lakes, and streams on a watershed basis".

Under Subobjective 2.2.1, measures for the Strategic Targets for the entire United States are listed. Those that apply to New Jersey are:

- **Full Restoration Measure** - *"By 2012, attain water quality standards for all pollutants and impairments in more than 2,250 water bodies identified in 2002 as not attaining standards."*
New Jersey's 2012 commitment for the Full Restoration Measure is 40-50.
- **Partial Restoration Measure** - *"By 2012, remove at least 5,600 of the specific causes of water body impairment identified by states in 2002."*
New Jersey's 2012 commitment for the Partial Restoration Measure is 80-100.
- **Watershed Improvement Measure** - *"By 2012, improve water quality conditions in 250 impaired watersheds nationwide using the watershed approach."*
New Jersey's 2012 commitment for the Watershed Improvement Measure is 10.

PAM 2: Reduction in amount of total sediment loadings (in tons)

Grants Reporting and Tracking System (GRTS) entries for the projects that performed implementation work during federal fiscal year 2006 (10/1/05 through 9/30/06) represent a total cumulative load reduction of 890.5 tons/yr of sediment. This is a huge increase from federal fiscal year 2005's figure of 86.1 tons/yr. See the table in Appendix III for a breakdown by project of the reductions reported.

PAM 3: Reduction in amount of total nitrogen loadings (in pounds)

GRTS entries for the projects that performed implementation work during federal fiscal year 2006 (10/1/05 through 9/30/06) represent a total cumulative load reduction of 13,580.2 lbs/yr of nitrogen. Again, this is a huge increase from federal fiscal year 2005's figure of 455.1 lbs/yr. See the table in Appendix III for a breakdown by project of the reductions reported.

PAM 4: Reduction in amount of total phosphorus loadings (in pounds)

GRTS entries for the projects that performed implementation work during federal fiscal year 2006 (10/1/05 through 9/30/06) represent a total cumulative load reduction of 2,749.0 lbs/yr of phosphorus. Again, this is a huge increase from federal fiscal year 2005's figure of 85.3 lbs/yr. See the table in Appendix III for a breakdown by project of the reductions reported.

PAM 5: Number of watershed-based plans supported under State Nonpoint Source Management Programs since the beginning of FY '02 that have been substantially implemented.

None of New Jersey's approved watershed-based plans have been substantially implemented due to the enormous costs associated with undertaking the numerous measures that are described in the approved plans and the significant funding limitations. However, there are 7 plans on which implementation has been initiated and the projects are outlined in the chart in Appendix V. The Department's funding priority for the current 319(h) funding cycle is for the funding of implementation measures from those plans listed in Appendix IV. It is also important to note at this time that the New Jersey Legislature also provided the Department with an additional 5 million dollars of state CBT revenues to fund priority implementation projects from approved watershed-based plans. The implementation projects are listed in the table entitled "Project Implementation Initiated for the Watershed-Based Plans" in Appendix V. Funding of these projects in addition to those funded through the 319(h) funds will assist in the overall effort to substantially implement the nonpoint pollution abatement measures from our approved plans. Please also see the "Success Stories" section below.

Success Stories

Pequannock River Thermal Mitigation, Monitoring and Assessment

The main goal of this project was to reestablish a riparian canopy along a section of Bailey Brook (which will reduce water temperatures in the brook as well as in the receiving portion of the Pequannock River in Riverdale) and a section of the Pequannock River in Riverdale. The Pequannock River is a Trout Production (TP) Category-1 (C1) stream along much of its length.

Location

The Pequannock River is located in Watershed Management Area (WMA) 3, United States Geological Survey (USGS) HUC-11: 02030103050. The subwatershed is the Pequannock Watershed. The Pequannock River Watershed is located in northeast New Jersey and a majority of the area is located within the Highlands Preservation Area.

Problem

The Pequannock River has documented issues with temperature impairment. The temperature impairments are related to several sources. Beavers in the upper watershed build dams that create small shallow impoundments that then provide heated water downstream. There are five major water supply reservoirs within the watershed and water released over the spillway of the dams is heated surface water. In addition, the releases are not always sufficient to provide the necessary flow leaving very shallow,

slow-moving water in the stream channel, which is heated by the sun. There are areas where loss of riparian corridor has also increased stream temperature, as the summer sun beats unshaded onto the stream. In addition, stormwater heated on parking lots and other impermeable surfaces adds to the temperature impairment.

Studies

Several segments of this stream have been listed on the New Jersey Integrated List, sublist 5, the list of impaired waterbodies. The Department established a temperature TMDL for 9 stream segments that was approved by EPA in September 2004. The Department also funded a Priority Stream Segment Study, which provided a detailed Restoration Plan to address temperature in the Pequannock River Watershed.

To better understand their influence a study was conducted in 2004 of temperatures and flow rates in 11 significant tributaries. Temperature data was collected from June to September on these 11 tributaries and several stations on the mainstem Pequannock. The comparison of tributary flow and tributary temperatures to mainstem temperatures was intended to show the relative influence and importance of each tributary. The Pequannock River Coalition (PRC) was the first volunteer group to receive certification for monitoring, and all sampling was conducted under an approved quality assurance project plan (QAPP).

This project included identification and Geographic Information System (GIS) mapping of all stormwater outfalls in the Lower Pequannock drainage basin. This information was freely provided to all the municipalities for their information.

Implementation

The re-establishment of a riparian canopy on the Pequannock River and a tributary to the Pequannock, Bailey Brook, was a main component of this project. Although re-forestation should occur naturally over time, this process can be greatly accelerated through the planting of a riparian corridor. While the cost and labor involved in planting thousands of linear feet with trees is prohibitive, the PRC has produced excellent results at other sites through the installation of cuttings of willow and Red Osier Dogwood. These cuttings are readily harvested from surrounding areas to reduce project costs, are far easier to plant, grow rapidly and are less prone to damage from wildlife browsing than tree seedlings.

Three six-foot river birch trees were installed at the Riverdale site and 500 Red Osier Dogwood and black willow cuttings were installed at the Bloomingdale and Riverdale sites during 2004. Two dozen volunteers participated in the plantings.

Results

Due to some loss of plants, and damage from Borough maintenance staff at one of the sites a second planting was conducted by volunteers in April and June of 2005. As of July 2005 the plantings have not been damaged and the majority of the cuttings are exhibiting vigorous growth. On-going maintenance by the volunteers has included hand removal of invasive species, especially Japanese knotweed.

In April of 2006 volunteers installed additional cuttings along Bailey Brook. A survey of this site in June 2006 showed some cuttings from prior years had reached heights of 3 feet. Shading of the water was noticeably increased. It should also be noted that the prevention of streambank mowing not only protected our plantings, it encouraged native plant establishment. In fact, by mid-summer it was difficult to distinguish our plantings amid luxuriant growth of jewelweed, goldenrod, salvia and other plants.

After the 2004 plantings at the Riverdale site were completed, an assessment was performed. All trees and about 35% of cuttings remained viable in 2005. A supplemental planting occurred in April of 2005. The loss of some of the initial cuttings is attributed to unusually high flows on the river in 2004.

In April of 2006 additional willow cuttings were installed at the Riverdale site and one new tree was planted – a 6-foot basswood. Prior cuttings were still healthy. Some willows had reached heights of more than 5 feet and dogwoods reached heights of 3-4 feet. One of the trees planted in 2004 had been damaged, apparently by road maintenance workers, but was still healthy. Many native trees (silver maple, elm, and red maple) had sprouted in this area and some of these surpassed our planted trees in height.



Riverdale site 2004.



Riverdale site 2006.

In 2005 the streambank growth was still limited. With this in mind, the 1.3-1.5C temperature difference above and below the planting site in 2005 represents a “before” condition and underlines the temperature elevation caused by the loss of a shading

canopy at this site. The increase in temperature became greater between the upper and lower readings as flow rates in the stream diminished over the course of the summer.

In 2006 the difference in temperature readings was markedly reduced. This was attributed to the increase in shade provided by the plantings. It should be noted that, due to the stream's north/south orientation, temperatures are highest from 11:00 a.m. to 1:00 p.m. when sunlight is least reduced by bankside vegetative cover.

Temperature Monitoring – Bailey Brook - 2005

Date	Time	Temperature (C) Above Planting Site	Temperature (C) Below Planting Site	Difference
07/06/05	11:00	21.5	22.8	+1.3
07/11/05	14:00	21.5	23.0	+1.5
07/22/05	12:18	21.4	24.8	+3.4
08/12/05	10:29	21.8	24.5	+2.7
Average				+2.225

Temperature Monitoring – Bailey Brook – 2006

Date	Time	Temperature (C) Above Planting Site	Temperature (C) Below Planting Site	Difference
07/11/06	12:45	20.1	20.9	+.8
07/17/06	16:20	23.1	23.9	+.8
07/19/06	13:16	21.4	22.6	+1.2
07/26/06	14:11	21.4	23.3	+1.9
07/27/06	11:11	20.4	21.0	+.6
07/29/06	16:32	23.7	24.2	+.5
07/30/06	14:25	22.8	24.4	+1.6
08/08/06	12:30	22.9	25.3	+2.4
Average				+1.225

The major partner in this project was the Pequannock River Coalition (PRC). Although the grant was awarded to the PRC, and staff time was funded for the continual temperature monitoring that was conducted and the survey and status (extant or abandoned) of the beaver dams, the labor for the revegetation of the riparian canopy was provided by dedicated volunteers of the Pequannock River Coalition.

Funding for this project was through the Section 319(h) of the Clean Water Act in the amount of \$29,695 with a match of \$7,950. The project was awarded in September 2003 and the majority of the work was completed by 2004. In 2005 as discussed previously, there were additional plantings.

Next Steps

A significant component of this grant was to build temperature data over the watershed and tributaries and over time.

For further information on this project contact:

Ross Kushner, Pequannock River Coalition

pqguy@optonline.net

Implementation of Storm water Best Management Practices at Lake Alberta, Monmouth County

The goal of this 319(h) grant project is to implement lake and stormwater BMPs in an effort to measurably reduce pollution in storm water discharges from Lake Alberta.

Location

Lake Alberta is a two-acre, man-made coastal lake located in WMA 12, USGS HUC 11: 02030104090. Lake Alberta is located on Neptune Boulevard near Sixth Avenue in Neptune Township, New Jersey.

Problem

This coastal lake is also a part of the Monmouth Mid-Coast Subwatershed region of the Shark River, a federally listed 303(d) impaired water body for fecal coliform, dissolved oxygen, TSS, phosphorus, and petroleum hydrocarbons. For decades Lake Alberta served as a retention basin for untreated run off from an extensive network of stormwater conduits that drained into Lake Alberta from a three square mile of highly developed land use. Most development in Neptune had occurred within the drainage area prior to the enactment of federal and state stormwater management regulations. As a result, the majority of the stormwater run-off entering into waterbodies within this urbanized area receives little or no pre-treatment prior to discharge.

Lake Alberta's most eastern outlet discharges from Campbell's Boat Yard into the Shark River 1,000 feet from Neptune City's Memorial Park Beach. The eastern part of Lake Alberta drains into the Musquash Cove where very high levels of fecal coliform exceed water quality standards and are prevalent under both dry and wet conditions. This discharge has been identified as a significant source of pollution.

Studies

Water quality sampling plans were initiated to compare pre- and post-BMP water quality conditions. Parameters tested for in Lake Alberta include temperature, dissolved oxygen, fecal coliform, and sedimentation rate.

Implementation

The major BMPs implemented through this project include a stormwater intercept, a sub-surface aerator system, a line skimmer and a waterfowl deterrent system. The installation

of the line skimmer was to reduce surface sheen and levels of hydrocarbons entering the lake at the primary stormwater discharge point in Lake Alberta. The passive skimmer was placed within the stormwater treatment chamber.



Hydrocarbon Filter

The Township of Neptune authorized 30.7% of the total project amount, in compliance with the match requirements of the agreement.



Aerator operating in Lake Alberta



Results

The installation and operation of the oil and grit separator has yielded meaningful pollution reduction from Lake Alberta: a nitrogen reduction of 3,036 lbs/yr, a phosphorous reduction of 347 lbs/yr, and a sediment reduction of 109 lbs/yr. Installation of waterfowl deterrent measures include construction of vegetation barriers and fencing to hinder waterfowl access to the lake and the installation of public education and outreach signs that promote watershed awareness and discourage feeding of the geese.

The grantee has provided pollutant load reductions that are expected from these implementation measures.

Next Steps

The grantee will be conducting pre- and post- water quality sampling during the spring of 2007 under wet flow conditions to further evaluate the effectiveness and performance of the BMPs installed.

Mendham Township Detention Basin, Whippany River, Passaic River Watershed

The grant funding for this project was used to change the existing detention basin's outflow by managing the flow of normal levels of stormwater runoff for recharge. The environmental objective was to reduce suspended solids and fecal contamination flowing from the basin into the Whippany River at Corey Lane and to encourage recharge of ground water through the detention of water in the basin. Funding for this project was through the Section 319(h) of the Clean Water Act in the amount of \$27,000. The project was awarded in September 2002 and the majority of the work was completed by 2005.

Location

This project is located in WMA 6, USGS HUC-11: 02030103050. The basin is located on the north side of Mendham Road - Route 24, and across Route 24 from the Whippany River (HUC 14: 02030103020020).



Opening day of fishing season on the Whippany at Speedwell Dam in Morristown

Problem

The basin, its inflow and outflow, had initially been designed years ago to meet local flood reduction standards in effect at that time by moving large quantities of run-off following a storm event through the basin and downstream as quickly as possible.



The Patriots Path crosses the river near Mendham Road

The basin was designed and installed in the 1970's and sized for 100-year storms. All runoff moved quickly through the basin from the in-flow, through stone channels, out the outflow and into the Whippany River. While the basin was overgrown with vegetation, which did provide some biological removal of pollutants, the water was not detained long enough to be effective.

Studies

Sample charts demonstrate the level of fecal coliform and strep, which were still leaving the basin in outflow to the river.

Implementation

This project included modifying stormwater flow by removing existing stone channels originally built to guide storm water runoff and removing exotic invasive plant species and replacing them with more than eight hundred native plant species of herbaceous and shrub layers to encourage stormwater detention. A total of 850 native plant species were planted in the 20,000 square foot project site in the basin itself, and along the perimeter of the site 60 fence stakes and 750 feet of fence netting were installed (later moved for aesthetic reasons at the request of the township).



Detention basin prior to implementation



Detention basin post- implementation

The project partners include Mendham Township, the Whippany River Watershed Action Committee, Sarah Cavanaugh Landscape Design, the Morris County Soil Conservation District and the Morris Land Conservancy.

Considerable in-kind services were contributed to this project. Mendham Township provided 97 man-hours and 31 vehicle hours for a total municipal in-kind value of \$4,964.69. Volunteer planting hours contributed to this project through the Morris Land Conservancy, Novartis and Pfizer Companies provided an equivalent in-kind match of \$2,600.06. Mendham Township has committed to continuing maintenance of the basin.

Results

The design and engineering of the retrofit of the outflow was successful in retaining water below a depth of 3 feet for recharge into the aquifer. The amount of total suspended solids (TSS) has been reduced when compared to the conventional detention basin. Fecal coliform contamination is also reduced through exposure to sunlight in the basin and settling out prior to entering the Whippany River.

PRE-MENDHAM DETENTION BASIN RETROFIT			
Storm Date (0.75 inches of rainfall in 2 hours preceding sample)	Location	Total Suspended Solids (mg/Liter)	Fecal Coliform (Colony forming units/100ml)
10/15/03	Inflow at Conifer Drive	12	200 / 100
10/15/03	Outflow at Basin	106	60,000 / 100
Storm Date (2.5 inches; sample taken 3 hours into event w/ 1.5 inches of rain fall)			
11/19/03 Inflow at Conifer Drive	Inflow at Conifer Drive	9	310 / 100
11/19/03	Western Inflow	No sample	200 / 100
11/19/03	Outflow at Basin	26	740 / 100

Sampling data by Ralph Rhodes, WRWAC

Although the cause of the rise in fecal coliform levels as water flows through the basin is unknown, through the implementation of this project, the contamination reaching the Whippany River is significantly reduced. No post-installation sampling was provided for in the grant, however, detention of stormwater has been observed and detention and

recharge should provide up to an 80% reduction in TSS, and a significant reduction in fecal coliform downstream.

Next Steps

Grant monies were allocated to help fund the development of a stormwater management computer model for application not only at the Mendham site, but also throughout New Jersey.

For further information on this project contact:

Louise Jensen, Whippany River Watershed Action Committee

terraver@optonline.net

Hoffman Park Stream Restoration Project, Union Township, Hunterdon County

In 2003, the Stony Brook-Millstone Watershed Association and the New Jersey Water Supply Authority (the Authority), along with Department and the South Branch Watershed Association, received a Targeted Watersheds Grant from the U.S. Environmental Protection Agency to protect surface water quality in the Raritan River Basin. The goals for the restoration project included:

- Correcting severe environmental degradation caused by the channel instabilities
- Preventing further degradation from occurring
- Protecting and enhancing water quality within the FW2-TP(C1) stream
- Protecting and enhancing aquatic, riparian, and wetland habitat
- Improving park access and park aesthetics
- Preventing the reduction of reservoir capacity by sediment deposition.

Location

This project site is located in the Raritan River Basin, WMA 8 in Union Township, Hunterdon County.

Problem

Prior to implementation of the Authority's project, this reach of Mulhockaway Creek followed a relatively straight course through forested upland and wetland areas. A deteriorated and undersized culvert was present under the access road.

An accumulation of sediment had occurred on the upstream side of the culvert. Streambank erosion was evident upstream of the culvert and scour on the downstream side of the culvert resulted in an approximately five-foot drop in elevation from above the culvert to below. The stream channel had incised approximately five feet below the top of the bank downstream of the culvert, leading to banks that were approximately six feet in height, eroding and unstable.

Studies

To identify implementation projects for this grant, the Authority conducted assessments of streams throughout the Spruce Run Reservoir watershed. Also, six seasons of pre-construction macroinvertebrate monitoring were conducted at Hoffman Park.

Implementation

Three stream restoration projects were conducted as part of the grant:

- Crystal Springs, Spruce Run, Lebanon Township, Hunterdon County. See http://www.raritanbasin.org/basin_bulletin/Fall2006/CRYSTALPICS.htm
- Old Farm Road, Mulhockaway Creek, Union Township, Hunterdon County http://www.raritanbasin.org/basin_bulletin/summer2005/OFR.htm
- Hoffman Park, Mulhockaway Creek, Union Township, Hunterdon County. The Hoffman Park Stream Restoration Project is located on a branch of Mulhockaway Creek at the eastern end of the park, off Mechlins Corner Road. Hunterdon County owns and manages the park.

The Authority hired the Louis Berger Group, Inc. to design a stream restoration project that would replace the culvert, better connect the stream with its natural flood plain and riparian wetlands and reduce sediment movement to Spruce Run Reservoir. Since Hoffman Park is located within the Highlands Preservation Area, Berger worked closely with Department's Division of Land Use Regulation to develop a design that would meet the requirements of the Highlands Act within the site constraints. The project received the first Highlands permit issued for such a project in June 2006.



Downstream face of culvert prior to construction



High banks downstream of culvert prior to construction

Berger's restoration design adjusted channel geometry and sinuosity to establish the appropriate channel slope for effective transport of sediment load without significant deposition or aggradation.

The project design included the following:

- *Adjust stream pattern and profile:* The stream sinuosity, or pattern, was adjusted to establish a stream slope capable of transporting the sediment load without degrading or aggrading the channel.
- *Adjust stream dimension:* A bankfull bench was established along the stream channel to provide a place for energy dissipation of water and sediment during high flow events. The bench also provides riparian habitat.
- *Install instream structures to stabilize the stream:* Several types of in-stream structures - log vanes, cross vanes and root wads - were installed to stabilize the stream bed, reduce streambank erosion, reduce near-bank stress and create aquatic habitat.

Log Vanes - A log vane is used to redirect flow away from outer meander banks, which maintains bank stability, reduces erosion of the banks, and ultimately prevents down valley channel migration. In addition to the stability benefits the log vanes provide to the channel, they also provide aquatic habitat.

Cross Vanes - Three cross vanes were installed upstream and downstream of the natural bottom, arched culvert to control the stream grade, stabilize stream slope, and focus the flow of water and sediment away from the bridge foundation and roadway embankment. The structures also provide valuable aquatic habitat by maintaining a scour pool and a riffle at the downstream and upstream ends of the structure.

Root Wads - The tree roots in the root wads reduce the sheer stress along the bank, making the bank less susceptible to erosion. Ten root wads were installed into the stream banks on the outside of meander bends to improve bank stability and enhance habitat complexity.

- *Replace the culvert system:* The deteriorated culvert was replaced with a concrete bridge that spans the stream to provide fish passage and improve flow and sediment transport.
- *Plant native vegetation:* An herbaceous seed mix and annual cover crop were planted at the end of construction in August and September. More than 400 trees and shrubs and approximately 1,400 willow and dogwood stakes were planted in November. Additional vegetation was planted in the spring of 2007.

Construction began in late June 2006. Vollers Excavation and Construction, Inc. of North Branch, NJ served as the General Contractor, completing the excavating and grading tasks and overseeing the landscaping subcontractor. Berger provided full-time construction management. Hunterdon County Parks Department provided wildlife monitoring management.



Visitors to Hoffman Park Site



Construction Mobilization,
June 2006

In order to complete the work, the stream was diverted around the project reach, through an adjacent borrow pit and back into the channel at the downstream end of the project reach. This enabled Vollers to work in dry conditions as they carved the new channel and bankfull bench and installed the structures. Construction took approximately nine weeks. On September 14th, 2006 the stream was re-diverted into the new channel.

Results

The project area experienced several significant storms following completion of construction - one on the day after the stream was diverted into the new channel. These storms provided an indication of how dynamic the Mulhockaway Creek stream system is and reminded the project partners that the computer models can't predict everything. Stream systems are not static. We expect them to change over time, but our project reach experienced many changes very quickly, leading to the need for adaptive management. Authority staff worked with Berger to design project modifications. The Authority's Grounds Maintenance staff installed the modifications in December 2006.



New arch concrete bridge,
September 2006



Completed cross vane



Completed project, October 2006



Completed project, October 2006



Completed project, March 2007

Next Steps

The Authority is monitoring the success of the project in several ways. As mentioned, six seasons of pre-construction macroinvertebrate monitoring were conducted at Hoffman Park. Post-construction macroinvertebrate monitoring will continue for at least two years. Next, the Authority will be monitoring the vegetative success.

Thereafter, we will be conducting geomorphology surveys at the project site. By surveying the locations of the streambed, the banks, the meanders of the stream, the stream's movement within its new pattern can be monitored and compared to an acceptable range of characteristics.

For other information detailing the Hoffman Park project, see:
http://www.raritanbasin.org/basin_bulletin/Fall2006/BRIDGE_DAY.htm
http://www.raritanbasin.org/basin_bulletin/Fall2006/Stream_opening.htm, or contact
Kathy Hale, NJWSA, (908) 685-0315, ext. 28 or khale@raritanbasin.org.

Mary Jane Pond Restoration, City of Linwood, Atlantic County

A four-phased plan was presented to the Department in an application for a \$100,000 grant to dredge the pond; to manage the stormwater discharge from the upstream detention basin; to control the debris and contamination from entering the stormwater management system at the twenty-three (23) stormwater inlets; and to stabilize the pond embankments. The total project cost was underwritten in part from the Department's grant of \$100,000, a contribution of \$37,000 from the Linwood Board of Education and in-kind services from the city's Department of Public Works to install drain guards at the upstream inlets.

Location

The project site is located in Mary Jane Pond, WMA 15 in the City of Linwood, Atlantic County.

Problem

Mary Jane Pond was impacted by stormwater runoff from an upstream detention basin on the Seaview School Property and the upstream introduction of twenty-three (23) stormwater inlets. These conditions caused the pond to overflow and erode its banks, causing the banks to collapse, and to fill the pond with sediment.



Pre-restoration view of the pond with adjoining residence.

The effects of the unmanaged runoff not only caused the pond to fill with sediment to the point where the water was only several inches deep, but also caused wildlife as well as resident and migrating birds to abandon the pond as a habitat.



Pre-restoration view of the Pond with sediment
in the foreground



Pre-restoration view of the Pond with sediment
in the foreground

Studies

A Diagnostic Feasibility Study was commissioned and paid for by the City Council. The Study was undertaken by Environmental Consultant Francis Pandullo. The conclusions of the study are described in the Problem section above.

Implementation

Approximately 800 cubic yards of material was dredged from the pond to bring it back to its original condition. The material dredged from the pond was transported to the city's Public Works yard. The cooperation of the city's Department of Public Works in this regard assisted in controlling the cost of dredge removal and transport.



Dredging Operation



Stormwater detention basin under construction



Dredging Operation



Stormwater detention basin under construction

Conversion of the detention basin at the nearby Seaview School to a combination detention/retention basin was designed to attenuate peak stormwater runoff from the school property in order to reduce the impoundment and “swelling” of stormwater within the pond, which contributed, in part, to the erosion of the pond banks. The work was successfully accomplished as observed during the course of storm events.

Stormwater inlet guards are part of the city’s plan to comply with the Stormwater Management rules (in accordance with one of the 9 nonstructural strategies listed in 7:8) pertaining to point discharge contamination as defined in the low impact development (LID) Checklist. These guards will protect receiving waters from floatable debris. This work is undertaken as an in-kind contribution to the overall project. Bank stabilization through the planting of vegetative species was completed during the month of October 2006 under favorable weather conditions.

Results

The Mary Jane Pond Restoration Project was successfully completed as a result of the combined efforts of the Mary Jane Pond Restoration Citizens Group, the City Council of the City of Linwood, the City of Linwood Board of Education and the Department's Division of Watershed Management.



Completed conversion of the School
Detention/Retention basin



Completed conversion of the School
Detention/Retention Basin

The Department grant of \$100,000 toward the defined “in-scope” of work served as a catalyst to encourage participation in a number of “out-of-scope” endeavors. For

example, the Linwood City Council authorized and paid \$10,000 for the Diagnostic Feasibility Study, the Linwood Board of Education contributed \$37,000 toward the project costs, and the Linwood City Department of Public Works facilitated a reduction in the dredging and disposal costs by allowing the use of the city yard for storage of the dredged material. The installation of drain guards at the upstream stormwater inlets as in-kind services by the city's personnel will not only benefit the project, but will also comply with the intent of the Stormwater Management rules regarding point discharge. Additionally, the city approved a change order by which the contractor provided enhanced bank stabilization plantings in compliance with recommendations from the Department's Division of Land Use Regulation.



Completed Pond Restoration

USEPA Targeted Watersheds Grants

The USEPA Targeted Watersheds Grant (TWG) Program is designed to encourage successful community-based approaches and management techniques to protect and restore our nation's waters. Successful watershed organizations were chosen because they best demonstrate their ability to achieve measurable environmental results relatively quickly. By 2006, New Jersey was awarded TWGs for three out the four years since the program's inception.

Raritan River Basin

The 1,100 square-mile Raritan River Basin, located in north central New Jersey, covers an area that is home to 1.2 million people and 11 sub-watersheds. The Stony Brook-Millstone Watershed Association, working with the New Jersey Water Supply Authority and the New Jersey Department of Environmental Protection, will use its grant to implement a strategy to restore the basin. Their results-based initiative focuses on stream restoration and stabilization; riparian area protection; stormwater and nonpoint source pollution prevention management; implementing new municipal ordinances and promoting road-salting controls throughout the region.

Upper Passaic River

The Passaic River is an area of significant industrial activity and is one of the most impacted rivers in the state of New Jersey. Approximately two million people live within the 669 square miles of this watershed. Entitled "Development, Implementation, and Evaluation of a Water Quality Trading Program for the Non-tidal Passaic River Watershed," the NJ Department of Environmental Protection, along with a coalition of municipal wastewater treatment plants and two universities, will use funds from their TWG to create a trading program focusing on both point-to-point and point-to-nonpoint source trading. It focuses on creating practical, effective, and economically sound results while providing valuable information that may serve as a model for other water quality trading initiatives.

This project will be used to meet a phosphorus-based TMDL for the Passaic River, which was proposed by the Department to EPA on May 7, 2007. Under the TMDL, dischargers will be allowed to engage in water quality trading negotiations to effect a change in effluent limits, with Department approval. Any viable trading option would have to ensure that EPA and DEP requirements for trading are met, and there is full and enforceable accountability for required load reductions. A trading project must identify the fungible unit of trade and associated value to ensure a level playing field among potential traders. The effectiveness of alternative load reductions with respect to attaining applicable water quality criteria must also be established, as well as a means to ensure the goals of the project are being achieved. The Department must approve the tools that will be used to make these demonstrations before trading can proceed. The Department anticipates allowing 1 year from the date of permit issuance to negotiate trades so that treatment plant upgrades consistent with permit limits are implemented within the permit cycle.

Lake Hopatcong

Situated in the heart of the New Jersey Highlands Region, Lake Hopatcong is one of New Jersey's premier recreational resources. Covering over 2,600 acres with 38 miles of shoreline, the lake is the state's largest inland waterbody. The Lake Hopatcong Commission will build upon previously funded 319(h) stormwater activities to implement an approved phosphorus TMDL. The proposed projects will address stormwater contributions through the installation of a series of retrofits and BMPs, implement

measures that utilize iron oxide to inactivate phosphorus, and demonstrate an alternative wastewater treatment system. The project will focus on quantifying the phosphorus removal efficiency of each restoration measure.

In 2003, the Department completed a TMDL for total phosphorus (TP) in Lake Hopatcong. The TMDL establishes a target phosphorus load for the lake, which will require a 41% reduction in phosphorus loading to the lake. To implement this TMDL, stormwater outfalls around the lake were mapped and targeted monitoring was performed to assess the relative contribution of various sub-drainage areas. Also, a municipal-based Restoration Plan was developed for the Lake Hopatcong watershed, which outlined best management practices to be implemented in those sub-drainage areas with the highest phosphorus loads.

One educational initiative began in the summer of 2005 under the direction of volunteer commissioners and public. This initiative was a true grassroots push to inform people about the impacts of using fertilizer that contains phosphorus. There was a dramatic change in behavior as evidenced by the amount of non-phosphorus fertilizer sold at various local garden centers.

In State Fiscal Year (SFY) 2006, the Department provided a federal 319(h) grant to the Lake Hopatcong Commission to address the highest priority stormwater “hot spots” as identified in the TMDL and Restoration Plan. The funding was provided to implement stormwater BMPs and to install retrofits in the two municipalities contributing the largest stormwater load. Several of the represented municipalities have incorporated specific sites for BMPs in their Municipal Stormwater Management Plans required under N.J.A.C. 7:14, Phase II Stormwater Rules.

The Borough of Hopatcong phased sewerage, in conjunction with the 319(h) grant, is expected to reduce phosphorus loadings from the Borough of Hopatcong by 95%. For more information about the work being implemented at Lake Hopatcong, as well as what remains to be done, see the Lake Hopatcong Case Study in the *"2004-2006 State of New Jersey Nonpoint Source Report"* available on the Division's website at http://www.nj.gov/dep/watershedmgt/nps_program.htm.

Floatables Control

Clean Shores Program

The Clean Shores Program is responsible for the removal of wood, garbage and medical waste from tidal shorelines utilizing inmate labor. In 2006 the program removed 5.3 million pounds of floatables from 155 miles of shoreline bringing the total amount of wastes removed since 1989 to 109.6 million pounds. Cleaning up these wastes helps prevent the deleterious effects of marine debris upon recreational ocean bathing beaches

and the coastal environment. The program is also responsible for building dune fencing and planting dune grass in several oceanfront communities and one state park. In an average year, cleanups are carried out in cooperation with 45 municipalities, seven county agencies, five private contractors, two correctional facilities, two state parks, one federal park and the Department of Corrections. The program is funded entirely from the sale of shore protection motor vehicle registration plates.



The sponsoring municipalities and state/federal parks provide support to the program and provide advance payment for the cost of the cleanup. The program in turn reimburses the sponsors for the cost of waste disposal and contracted services incurred during cleanup activities.

The Clean Shores Program is also responsible for data collection, analysis and documentation for the Recreational Bathing Lakes program.

Like the Cooperative Coastal Monitoring Program (CCMP) (the CCMP program, with the participation of local environmental health agencies, assesses coastal water quality and investigates sources of water pollution), the Clean Shores Program is responsible for collecting bacteriological sampling data from statewide bathing lakes. Data from this program is analyzed and compiled into a report for the Department of Health and Senior Services and submitted to the 305(b) report. Annually, the program coordinates with 28 local health agencies and 12 state parks.¹

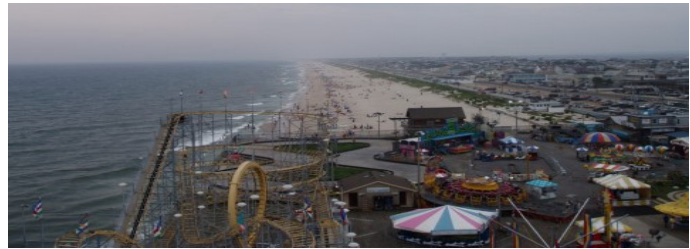
Adopt a Beach Program

Adopt a Beach Program volunteers perform biannual beach clean-ups along the Jersey Coast. This program not only removes debris from beaches but also enhances public awareness of the marine debris' negative impact on the economy, the environment and tourism. The 250 volunteers who participated in the fall 2006 cleanup removed 273 pounds of debris from 71 miles of coastline. This data is provided to the Ocean

¹ Additional floatables controls are being implemented through the state's Combined Sewer Overflow (CSO) Long Term Control Plans and the NJPDES Phase 2 municipal separate storm sewer system (MS4) programs. CSOs are combined sanitary and storm sewer systems. Under dry conditions all effluent is conveyed to a sewage treatment plant. However, under certain wet weather conditions, such as during heavy rain, there is too much water to be treated by the sewage treatment plants resulting in sewer overflows. There are approximately 280 CSO outfalls in New Jersey, in 30 municipalities located primarily in the New York metropolitan, Camden and Trenton areas. As part of the long term control strategy for these CSOs, solids and floatables controls have been designed and are being installed at each CSO discharge, thus reducing the amount of floatable material entering the state's surface waters. Under the NJPDES Phase 2 MS4 permits, a systematic replacement of catch basin grates with smaller openings will reduce the amount of floatable materials conveyed by storm drains to surface waters.

Conservancy, which compiles the data on an international level. The spring 2007 cleanup is scheduled for April 14, 2007.

Since the program began in 1993, Adopt a Beach volunteers have removed almost 1,000,000 items of trash and debris from New Jersey's beaches.



604(b) Grant Program

The Department receives federal funds to be passed through to county and regional planning entities for water quality management related planning. In the past, these grants have been to counties for the purposes of preparing Water Quality Management Plans (WQMPs), Smart Growth implementation, and on-site wastewater treatment system (OWTS) management plans. The Department continued to emphasize development of OWTS management plans for SFY 2006 and as a secondary priority continued support of WQMP development. The table below details New Jersey's 604(b) projects funded in state fiscal year (SFY) 2006 and project descriptions follow the table.

FFY 2005/SFY 2006 604(b) Water Quality Planning Pass-Through Grant Program Budget		
<u>Entity</u>	<u>Project Title</u>	<u>Amount Funded</u>
Township of West Milford, Environmental Commission	Development of an Onsite Wastewater Treatment (OWTS) Management Plan for the New Jersey End of the Greenwood Lake Watershed, Passaic County, New Jersey	\$108,217
Township of Bass River	Bass River Township Wastewater Management Plan	\$10,000
Township of Jefferson	Development of an Onsite Wastewater Treatment System Management Plan for the Township of Jefferson- Phase 2	\$59,700
Total Allocated		\$177,917
Total Available for SFY06		\$177,917

1. Development of an Onsite Wastewater Treatment Systems (OWTS) Management Plan for the New Jersey End of the Greenwood Lake Watershed, Passaic County, New Jersey
Grantee: Township of West Milford, Passaic County
Funds: \$108,217

This contract will allow West Milford Township to develop a comprehensive management plan for onsite wastewater treatment systems (OWTS) within the Greenwood Lake Watershed. This plan will be an integral component of the lake's phosphorus TMDL-based Restoration Plan, and will provide guidance in the reduction of fecal coliform loads. The current 319(h) funded grant project is primarily focused on stormwater-based phosphorus loads entering Greenwood Lake from the New Jersey end of the watershed. This project will contribute toward New Jersey's portion of the Restoration Plan by focusing on the phosphorus and fecal coliform loads that enter Greenwood Lake from New Jersey OWTS. The Belcher Creek sub-watershed will be the focus of the project due to documented high pollutant loads and levels of existing development.

This project has the following objectives:

- Develop a GIS-based process to collect and compile site-specific information on the OWTS within the watershed. This same process will also be used to track and document long-term developments / changes associated with the OWTS;
- Update the estimated annual phosphorus load entering Greenwood Lake from OWTS located in the New Jersey end of the watershed;
- Collect site-specific water quality data to assist in quantifying the phosphorus and fecal coliform loads entering the lake from New Jersey OWTS;
- Develop and apply an objective prioritization scheme to identify and rank the operation and maintenance concerns of the OWTS;
- Through the finding of the prioritization scheme, identify management measures and recommendations that should be implemented to best address site-specific OWTS concerns;
- Establish a set of protocol to provide short-term and long-term monitoring, operation, maintenance, replacement and upgrades of OWTS;
- Identify the technical resources and the fiscal budget needed to implement the OWTS Management Plan. Sources of both technical and financial assistance will be identified. As part of the required assistance in implementing the plan, a OWTS Management entity would be established to oversee and administer the plan;
- An aggressive and proactive education and outreach program that will provide information to watershed stakeholders, owners / operators of OWTS and the public on the need and value of implementing the management measures identified in the plan;
- Establish a comprehensive yet flexible implementation schedule for the management measures identified in the plan.

2. Development of a Wastewater Management Plan for Bass River Township
Grantee: Bass River Township, Burlington County
Funds: \$10,000

This contract will allow Bass River Township to develop a Wastewater Management Plan (WMP) as required by N.J.A.C. 7:15-5.23. The proposed WMP planning area will cover the current boundary of the entire township. At present there are no wastewater treatment plants with secondary treatment within the township limits. All residences and businesses are served by OWTS discharging into ground water. There is a very large area of the township with low density makes it impractical to construct wastewater treatment plant, however, there are a few parts of town that might qualify for a central wastewater treatment plant construction and/or upgrade. A new WMP is needed to enable the township to address construction and/or improvements of new wastewater treatment plants now and twenty years into the future. All work will be accomplished in compliance with N.J.A.C. 7:15, the Water Quality Management Planning Rule and the Department's WMP guidance document entitled "Instructions for Completing the Wastewater Management Plan Application and Guide to Format and Content Summary"

The project includes completion of the following tasks:

- Submittal of draft stormwater and stream corridor protection ordinances.
- Preparation of mapping.
- Collection of data and preparation of WMP narrative
- Completion of draft WMP and submission to the Department for approval. The draft will be in approvable form. Should the Department determine that it is not approvable, the township will provide in-kind services in order to completely respond to Department comments.

3. Development of an Onsite Wastewater Treatment Systems (OWTS) Management Plan for the Township of Jefferson- Phase 2
Grantee: Township of Jefferson, Morris County
Funds: \$59,700

This contract will allow Jefferson Township to complete a Management Plan for OWTS. Phase I of this project was funded by 604(b) SFY 2004 funds. Deliverables will include:

- Identification and prioritization of OWTS for remedial measures;
- Establishing a leachate monitoring program;
- Development short and long term management measures;
- Support of additional public education initiated in Phase I.

Permit Programs

The Department issues permits that control nonpoint sources of pollution through authority of the New Jersey Pollution Discharge Elimination System (NJPDES) rules. Permits require the implementation of certain appropriate BMPs. The enforcement of these permits contributes to restoring watersheds by reducing or eliminating the sources of pollutants entering a water body. Permits are an important first line of defense in addressing sources of pollution. There are many different types of permits issued by the Department, but the following touch on some aspect of controlling NPS pollution.

GENERAL PERMITS

General permits are used by the Division of Water Quality to streamline processing time for specific classes of wastewater discharges, including industrial site stormwater runoff and municipal stormwater runoff from municipal separate storm sewer systems (MS4s). In issuing general permits, processing time is greatly reduced because a standard set of conditions specific to a discharge type are developed and issued at one time (rather than issuing individually tailored permits for each discharger). After a general permit has undergone the required draft, public comment, and final issuance stages, it becomes available to dischargers that meet the established discharge requirements.

Basic Industrial Stormwater Permit (5G2)

This general permit is available to regulated industrial facilities that have eliminated or can eliminate within 18 months of authorization, all exposure of industrial materials or activities to stormwater (rainfall and snowmelt waters). Exposure may be eliminated by covering the materials or activities or by moving materials or activities indoors.

Concentrated Animal Feeding Operation (R8)

This general permit authorizes new and existing discharges from concentrated animal feeding operations and designated animal feeding operations required to obtain a permit pursuant to N.J.A.C. 7:14A-2.13.

Construction Activities (5G3)

This general permit authorizes point source discharges from certain construction activities. Regulated entities are required to develop a soil erosion and sediment control plan aimed at eliminating the flow of contaminated rainwater into streams and rivers. This general permit is issued through the local Soil Conservation Districts. In addition, the 5G3 also requires site waste management controls for such things as litter, construction debris, sanitary waste, hazardous materials, concrete washout, and spills and leaks. Post-construction requirements are implemented through the Stormwater Management Regulations.

Sanitary Subsurface Disposal (T1)

This general permit authorizes the discharge of sanitary sewage from facilities to a subsurface disposal (septic) system with a design volume in excess of 2,000 GPD. Any changes to these systems would require a permit modification that would kick them out of the T1 and require a new DGW permit application that would need WQMP consistency review. The only exception is for 1:1 replacement of a broken or failing system.

Tier A Municipal Stormwater Permit

The Tier A² Municipal Stormwater General Permit authorizes the discharge of stormwater from small municipal separate storm sewers. The permit was issued in response to USEPA's Phase II rules. Tier A municipalities are generally located within the more densely populated regions of the state or along or near the coast. The Tier A permit addresses stormwater quality issues related to both new and existing development. It requires the development of a stormwater management plan and the adoption of a stormwater control ordinance in accordance with N.J.A.C. 7:8-4. It also requires compliance with the residential site improvement standards that are also linked to N.J.A.C. 7:8 as well as implementation of ongoing operation and maintenance of BMPs. The other Statewide Basic Requirements for the Tier A Permit are:

- Developing a local public education program
- Storm drain labeling
- Adoption and enforcement of a pet waste ordinance
- Adoption and enforcement of a litter ordinance
- Adoption and enforcement of an improper waste disposal ordinance
- Adoption and enforcement of a wildlife feeding ordinance
- Adoption and enforcement of a yard waste ordinance
- Adoption and enforcement of an illicit connection ordinance
- MS4 outfall pipe mapping
- Monthly street sweeping of predominantly commercial streets
- Storm drain inlet retrofitting
- Stormwater facility maintenance
- Road Erosion Control maintenance
- Maintenance yard operations BMPS such as de-icing material storage, fueling operations, vehicle maintenance, and equipment and vehicle washing
- Annual Report certification
- Public Notice

Tier B Municipal Stormwater Permit

The Tier B³ Municipal Stormwater General Permit authorizes the discharge of stormwater from small municipal separate storm sewer systems (MS4). Tier B

² Tier A municipalities are defined as one of the following: 1.) are located entirely or partially within an urbanized area as determined by the 2000 census and have a population of at least 1,000; 2.) have a population density of at least 1,000 per square mile, and a population of at least 10,000 as determined by the 2000 census; or 3.) have a stormwater sewer system discharging directly into the salt waters of Monmouth, Atlantic, Ocean or Cape May Counties.

³ Every municipality not assigned to Tier A is assigned to Tier B.

municipalities are generally located in more rural areas and in non-coastal regions. The Tier B permit focuses on new development and redevelopment projects and public education. It also requires the development of a stormwater management plan and the adoption of a stormwater control ordinance in accordance with N.J.A.C. 7:8-4. It also requires compliance with the residential site improvement standards that are also linked to N.J.A.C. 7:8 as well as implementation of ongoing operation and maintenance of BMPs.

The other Statewide Basic Requirements for the Tier B Permit are:

- Developing a local public education program
- Storm drain labeling
- Annual Report certification

INDIVIDUAL PERMITS

Individual Stormwater Permit

Individual NJPDES permits are issued to facilities that cannot eliminate exposure of pollutants to stormwater. These facilities have to develop and implement Stormwater Pollution Prevention Plans to minimize or eliminate contact between pollutants and stormwater. Other permit conditions may require monitoring stormwater discharges for pollutants, and in some cases, effluent limitations may be imposed.

Individual Discharge to Groundwater Permits:

Sanitary Wastewater Permit

For discharges of sanitary wastewater over 2,000 GPD from various disposal methods, such as septic systems lagoons, spray irrigation, or overland flow, a sanitary wastewater permit provides the necessary management practices and monitoring requirements to ensure conformance with the NJDPES regulations and the Ground Water Quality Standards.

Industrial Permit

Discharges of industrial wastewater, such as cooling water, process wastewater, and boiler blowdown require a permit for the particular disposal method employed by the facility (lagoon, spray irrigation, overland flow, etc.) to ensure conformance with the NJPDES regulations and the Ground Water Quality Standards through management practices and monitoring.

Underground Injection Control (UIC)

Systems classified as underground injection system dispose of wastewater directly into the subsurface. These subsurface disposal systems include disposal beds or trenches, dry wells and seepage pits and can receive sanitary or industrial wastewater. UIC discharges are regulated via permits to protect underground sources of drinking water and ensure compliance with state performance standards as well as the Ground Water Quality Standards.

Aquifer Storage and Recovery

The injection of potable water into aquifers for future recovery requires a permit to ensure compliance with management practices of the injection process and with the ground water quality standards.

Agriculture



The Department continues to foster a partnership with the New Jersey Department of Agriculture (NJDA) and other agricultural organizations to achieve New Jersey's water quality goals. In some of New Jersey's more rural watersheds, agricultural land uses have been identified as a major nonpoint source of pathogens (fecal coliform) and nutrients (phosphorus). Therefore, implementing best management and conservation practices on agricultural lands, which will improve water quality, conserve water and energy, prevent soil erosion and reduce the use of nutrients and pesticides, is an important component of New Jersey's nonpoint source pollution control strategy.

Farm Bill Conservation Program Enrollment

The United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) provides technical and financial assistance to private landowners to improve natural resources and the environment. Much of the NRCS technical assistance is provided in cooperation with New Jersey's 21 counties and 15 Soil Conservation Districts. NRCS also administers the conservation programs made available under the 2002 Farm Bill.

In FY 2006, New Jersey received \$9,572,113 authorized by the 2002 Farm Bill for eligible New Jersey landowners and agricultural producers. The funds were administered through six USDA voluntary programs. The FY 2006 program funds have been used as indicated in the chart below. Following is a brief description of each of the Farm Bill conservation programs followed by program implementation data.

- **Agricultural Management Assistance (AMA)**

AMA reduces the economic risk of adopting conservation measures for limited resource, small scale and beginning farmers. No AMA funding was received for FY 2006.

- **Conservation Security Program (CSP)**

CSP rewards producers who are currently actively protecting soil and water resources on their farm. In 2006, the Raritan watershed in Morris, Somerset, Hunterdon and Middlesex Counties was selected for participation in the national program. Sixteen successful applicants received \$200,000 in their first-year payments, with a total of more than \$1 million to be paid over the life of their 5 or 10 year contracts.

- **Environmental Quality Incentives Program (EQIP)**

EQIP provides financial assistance to producers to install permanent measures or to adopt management strategies that address existing resource concerns. New Jersey received \$4,102,532 in FY 2006 and contracted with 86 producers to implement new conservation systems. Three entities received funding through Conservation Innovation Grants to bring new technologies directly to the field. The grants will study a regional agricultural waste composting facility, test the utility of a draft NRCS standard, and implement a vegetated channel system to uptake nutrients and increase filtration of runoff water on a nursery.

- **Farm and Ranch Lands Protection Program (FRPP)**

FRPP provides matching funds to help purchase development rights to keep productive farmland in agricultural uses. New Jersey received \$3,973,785 in FY 2006, which was passed on to three cooperating entities through Cooperative Agreements. The funding will allow nearly 2,500 acres to be protected from development.

- **Grassland Reserve Program (GRP)**

GRP offers private landowners the opportunity to protect, restore, and enhance grasslands on their property. No GRP funding was received for FY 2006.

- **Wildlife Habitat Incentives Program (WHIP)**

WHIP provides financial assistance to develop or improve wildlife habitat in six priority areas on nonfederal lands. New Jersey received \$1,000,236 for FY 2006. Approximately \$375,000 was obligated to 38 private landowners through individual contracts. New Jersey also signed five Contribution Agreements with cooperating partners for the remaining funds. These agreements will provide habitat improvements on nearly 3,400 acres. Installation or improvement of wildlife habitat generally has the same effect on NPS pollution as installing a buffer.

- **Wetlands Reserve Program (WRP)**

WRP provides technical and financial assistance in exchange for retiring marginal land from agriculture in order to enhance wetlands. For FY 2006, New Jersey received \$435,261 that enabled the funding of a new permanent easement project.

Statewide Program Implementation - FY 2006				
Program	Funded Projects		Potential Unfunded - Backlog 2007	
	Contracts (Acres)	Amount	Applications	Estimated Cost
AMA	Unfunded in 06	N/A	N/A	N/A
CSP	16 (5324)	\$1,016,385	N/A	N/A
EQIP	86 (7077)	\$3,736,583	60	\$2,386,920
GRP	Unfunded in 06	N/A	N/A	N/A
FRPP	22 (23962)	\$3,973,785	150	\$60,000,000
WHIP	38 (2810)	\$1,000,236	35	\$459,235
WRP	1 (720)	\$428,736	7 acres	\$5, 847, 300

Statewide Accomplishments - FY 2006			
Accomplishment	Planned	Applied	Estimated Annual Need
Conservation Planning on Cropland (Acres)	37,851	33,007	47,551
Nutrient Management (Acres)	18,569	7,424	23,724
Wildlife Habitat (Acres)	11,072	3,666	4,622
Wetland Restoration (Acres)	156	156	375
Grazing Lands (Acres)	8,689	4,221	8,645
Comprehensive Nutrient Management Plan (#)	42	31	108

New Jersey NRCS Conservation Innovation Grants (CIG)

The North Jersey Resource Conservation and Development (RC&D) and the Cook College Equine Science Center at Rutgers University are the 2005 New Jersey Conservation Innovation Grants (CIG) recipients.

North Jersey RC&D received \$75,000 to implement their proposal “River Friendly Farms.” This project is designed to provide recognition for farmers who assess the potential water quality impacts of their existing operation, and implement best management practices on their farms to reduce any negative impacts or enhance positive impacts. The project focused on the Neshanic River watershed, an intensely farmed area of Hunterdon and Somerset counties that is part of the Raritan River basin and water supply for thousands of New Jersey residents.

The Cook College Equine Science Center at Rutgers University received \$75,000 to implement various grazing land and barnyard area conservation practices at the Equine Science Center located at the Cook Campus. The grant will also fund educational workshops, seminars, and fact sheets that will demonstrate how the implementation and management of these practices on the typical equine or small animal farm can improve water quality as well as herd health. As part of the grant, Rutgers will be reaching out to most of the 7,600 small livestock producers in New Jersey who may not be aware of the types of programs and services that NRCS and USDA can provide.

New Jersey and twelve other states were selected to receive funds for the 2005 statewide grant competition to fund projects targeting innovative on-the-ground conservation, including pilot projects and field demonstrations that focus on water resources, soil resources, atmospheric resources, grazing land and forest health, or wildlife habitat. The 2002 Farm Bill established the Conservation Innovation Grants as part of the Environmental Quality Incentives Program.

Farm Service Agency (FSA) Programs

NRCS provides technical assistance to applicants and contract holders working with the FSA Programs, which include the following.

- **Conservation Reserve Enhancement Program**

The New Jersey Department of Environmental Protection, the New Jersey Department of Agriculture and the United States Department of Agriculture's Farm Service Agency jointly developed a Conservation Reserve Enhancement Program (CREP) proposal for New Jersey. The New Jersey CREP is designed to help farmers reduce nonpoint source pollution caused by agricultural runoff in an effort to improve water quality in New Jersey. Under NJ CREP, farmers receive financial incentives from the USDA's Farm Service Agency and the New Jersey Department of Agriculture to voluntarily remove marginal pastureland or cropland from agricultural production and convert the land to native grasses, trees and other vegetation.



Multiple rows of trees and shrubs, as well as native grass strips, combine in a riparian buffer to protect the creek that flows through it from nutrient runoff loads, temperature extremes, and also provides habitat.

The vegetation can then serve as a buffer to filter or contain agricultural runoff and prevent polluted stormwater runoff generated by farms from reaching neighboring water bodies.

New Jersey seeks to enroll 30,000 acres of agricultural lands into the program. The four NJ CREP practices will improve the quality of runoff from these lands. NJ CREP encourages farm owners and operators to voluntarily implement one or more of these conservation practices on their land by offering financial incentives. The program provides a 10-year enrollment period and targets the installation of riparian buffers, filter strips, contour buffer strips and grass waterways. Farmers will be able to enroll their land into NJ CREP by installing conservation practices under 10-15 year rental agreements and/or permanent easement contracts.

As of April 10, 2007, forty-eight NJ CREP contracts have been approved totaling 287.2 acres. This represents 173.4 acres of filter strips, 37.1 acres of grassed waterway, and 76.7 acres of riparian forest buffer.

- **Conservation Reserve Program (CRP)**

CRP allows producers to retire highly erodible or marginal cropland or pasture, and receive rental payments as well as financial assistance to convert the land to grass or trees. In 2006, NRCS provided assistance to 20 producers interested in converting expiring contracts into new contracts.

Soil Erosion and Sediment Control Act Implementation

The State of New Jersey adopted the Soil Erosion and Sediment Control (SESC) Act, Chapter 251 Program on January 1, 1976, to be administered by the state's 15 Soil Conservation Districts (SCDs) as a means to prevent soil erosion from construction sites, reduce nonpoint source pollution from sediment, and enhance water quality and stormwater quality. The SCDs review development and site plans to ensure that they are in compliance with SESC standards. Once the plans satisfy the standards, they are certified by the district. When work begins on a project, staff routinely inspect the site to make sure the soil erosion and sediment control measures in the plan are carried out in the correct construction sequence on the site. When construction is finished, SCD inspectors perform a final site inspection to ensure that the site has been properly permanently stabilized.

Conservation practices such as stormwater inlet protection, silt fencing, stabilized construction access, and temporary soil stabilization are just a few of the many measures that help reduce soil erosion on active construction sites.

The table below shows the number of plan applications received, and, of those, the number of plans that were certified by the districts and the number of acres represented in all of the certified plans for all of New Jersey's 15 Soil Conservation Districts by State Fiscal Year.

SESC PLAN APPLICATIONS			
SFY	# of Applications Received	Certifications Issued	Acres Under Development
2003	4,478	4,360	33,843
2004	4,752	4,686	32,378
2005	5,225	4,832	36,372
2006	5,908	6,016	28,648

Since the inception of the SESC Program, 108,610 applications were received and 105,441 certifications were issued on projects involving more than 799,734 acres of land. Through the implementation of the State Soil Conservation Committee Standards for Soil Erosion and Sediment Control in New Jersey on all projects in the Chapter 251 Program since 1976, tens of millions of tons of soil were prevented from causing damage to streams, lakes and downstream properties. Thus it is important to acknowledge the vital role of the Chapter 251 Program in New Jersey's NPS pollution control strategy to protect water quality.

Resource Conservation and Development

The North Jersey, South Jersey and Liberty Resource Conservation and Development (RC&D) Councils work with local and regional partners to address issues related to: water quality and water resource protection, sustainable farming and farm communities, and managing natural hazards.

The North Jersey RC&D Council was awarded \$84,715 through the USDA's 2006 Cooperative Conservation Partnership Initiative (CCPI) grants program to restore buffers on river and stream banks and wetlands on farmland in the Raritan River basin through the development and implementation of riparian restoration plans on agricultural lands throughout the basin. The USDA awarded \$5 million in such grants nationwide. CCPI funds projects that focus technical and financial resources on conservation priorities in watersheds and airsheds of special significance. The Raritan River basin includes 16 watersheds and extends through Hunterdon, Somerset, Union, Morris, Mercer, Middlesex and Monmouth Counties.

EDUCATION

The Division of Watershed Management has many programs and tools for stormwater, nonpoint source pollution and watershed education. These include newsletters and brochures for the community at large as well teacher workshops, free classroom presentations throughout New Jersey, the Watershed Watch Volunteer Monitoring Program, and free publications for students and teachers.



NJ Watershed Ambassadors Program

The NJ Watershed Ambassadors Program is a community-oriented AmeriCorps program designed to raise awareness about water issues in New Jersey. Through this program, AmeriCorps members are placed across the state to serve their local

communities. Watershed Ambassadors monitor the rivers of New Jersey through Visual Assessment and Biological Assessment volunteer monitoring protocols. In 2006, the Ambassadors monitored over 1,000 stream segments and conducted 130 monitoring training workshops. Watershed Ambassadors also made 760 presentations to community organizations and schools reaching 19,000 people. These interactive presentations provide information about water and watershed issues in New Jersey. The Ambassadors also worked with community organizations on 23 watershed partnership projects such as stream clean-ups, water festivals and storm drain marking. The Ambassadors worked with 2,500 volunteers to generate over 11,600 volunteer hours through these partnership projects and other community service events.



Project WET (Water Education for Teachers)

Project WET is a nationally renowned program that offers teachers a better understanding about the world's water resources through hands-on, multi-disciplinary lessons. NJ Project WET is a well-rounded program that focuses on water supply, water quality, water conservation, watershed management, land use planning and wetlands. Project WET provides educators with accurate insight into critical water issues while offering a large selection of creative teaching strategies. In 2006, 15 Project WET teacher-training workshops reached 182 teachers and non-formal educators, in turn reaching over 4,500 students. Three new workshop facilitators were trained.

Through the NJ Project WET Water Festival Mini-Grant Program, four schools held water festivals in 2006. Through these a one-day celebrations of water, students participate in a series of learning stations that examine different water issues and involve the local community.

The activities in Project WET, as well as those in the other associated guides sponsored by the Department (Project WILD and Project Learning Tree) were correlated to New Jersey's Core Curriculum Standards through a grant from the Environmental Education and Training Partnership. This on-line database will make it easier for teachers to use Project WET activities in the classroom.

Training Workshops

Volunteer monitors and watershed educators were offered several Training Workshops in 2006. These three two-day workshops offered unique training opportunities for the targeted participants, advancing the outreach and education goals of the Division.

Course Name & Location	Date	Audience	Attendees
Watershed Educators Conference Meadowlands Environment Center	June 27 & 28, 2006	Teachers & non- formal educators	72
Volunteer Monitoring Summit Monmouth University	November 2 & 3, 2006	Volunteer monitors, data users	112
Study Design Workshop Montclair School of Conservation	December 1 & 2, 2006	Volunteer monitors	20

Urban Watershed Education Program

The Urban Watershed Education Program is designed to educate students living in the Newark Bay Complex and other urban areas about the hazards of eating contaminated fish and help them to discover the beauty of the great natural resource. Students who participate in the program sample recreational opportunities that the bay has to offer while learning how to be responsible citizens within the estuary. The students experience 4 days of intense yet enjoyable instruction related to the local watersheds. In 2006, the program worked with 7 schools in Bayonne, Carteret, Elizabeth, Jersey City, Ridgefield and Trenton involving over 200 students in these urban areas with fish consumption advisories.



Watershed Watch Network

The Watershed Watch Network is a program acting as an umbrella for all of the volunteer monitoring programs within New Jersey. The Watershed Watch Network has two

advisory committees: Data Users and Water Resource Managers make up the Internal Advisory Committee and Volunteer Monitoring Program Managers throughout the State make up the Watershed Watch Network Council. A four-tiered approach has been developed to allow for volunteers to pick their level of involvement based on the purpose of their monitoring program, the intended data use and the intended data users. The goal of the program is to provide acceptable protocols and QA/QC requirements for volunteers if they choose to submit their data to the Department, to assist volunteers in designing and building upon their existing programs and to assist data users in gathering sound data for their uses.

NJ Electronic Data Management System

The NJ Electronic Data Management System was created because the Department recognizes the challenges associated with collecting and managing data. Conducting assessments, defining the current water quality conditions and getting the numbers and scores to actually mean something to an audience can be both time consuming and frustrating. Yet, volunteer monitors want the data they collect to be translated to the public in meaningful ways. The science behind "getting the numbers to talk" is not only a challenge, but an art form.

Although there is no one formula to cure all the issues associated with translating and interpreting the data, Department staff, a consulting firm or two, and the volunteer program coordinators from around the state, have created the first NJ public data management system. This online data management system has been designed to help alleviate the burden of data management and allow for volunteer collected data to be comparable and compatible with other available data. The system is a powerful tool for the volunteer community because it allows registered volunteers to run simple statistics, create graphs for visual comparisons or make available for download all available data of a particular watershed, water body or geographic location. This new system allows the data to be effectively managed, analyzed and reported for use by the Department, other interested organizations and the general public.

To begin using the NJ Electronic Data Management System as a volunteer organization, you must register for an ID and PIN at: <http://www.nj.gov/dep/online>. Training, individual group assistance and support is available. For more information, please continue to check the Division of Watershed Management's website at <http://www.nj.gov/dep/watershedmgt> or request to be on our data system user group email list at volunteermonitoring@dep.state.nj.us

Clean Water Raingers Program

The Clean Water Raingers Program offers educators a number of teaching materials for their students as well as background information on watersheds and nonpoint source pollution. Educators who participate in the Clean Water



Rangers program are provided with free booklets and associated materials for their elementary school age students. The booklets and stickers are also popular at family oriented events and festivals. In 2006, we distributed 15,000 Clean Water Rangers Activity Books, 14,000 Clean Water Rainger Coloring Books and 20,000 Clean Water Rainger Stickers.

DWM Publications

Division publications are also available for free distribution to municipalities, watershed associations, environmental groups or other organizations. For 2006 we distributed over 10,000 copies of What's A Watershed? Brochure. In addition, the unit developed and distributed NJ Watershed Ambassador flyers, NJ Watershed Watch flyers, Highlands Fact Sheets, Fish Smart, Eat Smart Brochures and Watershed Management Area Fact Sheets for each of the 20 watershed management areas. The Division also publishes a free newsletter entitled Watershed Focus, which includes articles on watershed management, stormwater, nonpoint source pollution and water education. In 2006, four issues of the newsletter were distributed to a mailing list of 4000 recipients.

The Stormwater Best Management Practices Manual is electronically available through www.njstormwater.org or through the Department's Office of Maps and Publications.

All of these publications and numerous others are also available on the Division of Watershed Management website.

Clean Water Council

The Clean Water Council advises the Department on water issues. As DEP liaison to the Clean Water Council, the Division coordinated its 11 regular meetings. The Annual Public Hearing on "Improving Water Quality Planning and Management" took place on October 10, 2006 and focused on eight questions related to the DEP's Water Quality Management Planning Rules. The council provided the Commissioner with recommendations based on the 4.5 hours of testimony received.

PROTECTION

This section serves to highlight New Jersey's water quality protection measures through regulations designed to protect the state's declining water supply and to ensure water quality for all New Jersey's residents, and the state's open space preservation programs.

Legislation & Regulation

Highlands Water Protection and Planning Act Rules (N.J.A.C. 7:38)

The Highlands Water Protection and Planning Act, N.J.S.A. 13:20-1 et seq. protects drinking water for over 5.4 million people and helps preserve New Jersey's dwindling open space. On December 4, 2006, the Department of Environmental Protection readopted with amendments the Highlands Water Protection and Planning Act rules, N.J.A.C. 7:38. The rules incorporate the requisite standards of various land use, water resource and environmental protection statutes and establish a consolidated Highlands permitting review and approval process for activities constituting major Highlands development proposed in the Preservation Area. The Department made several agency initiated changes on adoption, all of which either clarify or make consistent provisions of the rules.

Water Quality Management Planning Rules (N.J.A.C. 7:15)

The Department, primarily through the Division of Watershed Management, administers the Water Quality Management Planning rules, N.J.A.C. 7:15. The current rules became effective on October 2, 1989. These rules serve two basic functions: they establish the Department's general regulatory framework for water quality planning and supplement other Department rules pertaining to wastewater management.

An integral component of areawide WQMPs are Wastewater Management Plans (WMPs). WMPs are the vehicle through which the continuing planning process integrates local and regional planning into the areawide WQMPs. The intended purpose of the WMPs is to project future development and estimate the wastewater management needs associated with that development. These plans could also provide the vehicle to ensure that sewer service was not extended into areas inconsistent with State Development and Redevelopment Plan State Planning Area designations and environmentally sensitive areas. Lastly, because WMPs project future land use and shape the pattern and density of development through the wastewater management alternatives selected within given areas, these plans are instrumental in quantifying existing and future nonpoint source pollution loads and in implementing best management practices to reduce those pollutant loads. To accomplish these objectives, WMPs were to be prepared for the entire state by 1995 and were to have been updated every six years similar to the requirement for municipal master planning in the Municipal Land Use Law.



In the current rules, the assignment of wastewater management plan responsibility occurs along a hierarchy beginning with designated areawide Water Quality Management planning agencies, through the Passaic Valley Sewerage Commissioners, various joint meetings and municipal utilities authorities and ending with municipalities. This hierarchy has resulted in the present designation of 161 wastewater management planning agencies, each with responsibility over a discrete wastewater management planning area. Unfortunately, the overwhelming majority of those planning agencies have not kept the WMPs current, as required by the Water Quality Management Planning rules. As a result, most WMPs cannot be relied upon to ensure that adequate wastewater treatment exists to support the development contemplated by local land use plans, and to accurately assess the impacts of those wastewater management decisions on water resources.

The existing rules are largely process driven, detailing the procedures for the processing of WMPs and amendments. The existing rules also require the submission of future wastewater estimates, consideration of wastewater management alternatives and mapping

of various environmental features, but do not include thresholds for when an application should be adopted or disapproved based on these factors.

New Jersey Gubernatorial Executive Order No. 109(2000) (EO 109) was signed in 2000 to ensure that the Department considers secondary and cumulative impacts of development in the water quality planning process. EO 109 requires the Department to assess alternatives designed to address depletive and consumptive water use, detailed land use, environmental build-out and pollutant loading prior to making a final decision on an application for approval of a WMP, or WMP update. In implementing EO 109, the Department has been evaluating new or expanded discharges to surface water with respect to the antidegradation requirements of the Surface Water Quality Standards, N.J.A.C. 7:9B. In addition, the Department has been evaluating the adequacy of stormwater management and riparian zone protection relative to water quality and quantity impacts of future development. The Department has also evaluated water supply impacts to encourage the selection of an alternative that will allow for future development while minimizing decreases in stream flow resulting from consumptive or depletive water losses. Lastly, the Department has assessed encroachment on habitats for threatened and endangered species as the result of specific projects or activities and future sewer service area designations and has attempted to avoid or minimize encroachment into threatened and endangered species habitats designated as Rank 3, 4 or 5 on the Department's Landscape Project Maps. After gaining experience in implementing EO 109, the Department is ready to promulgate rules on the Department's criteria for conducting these analyses.

On April 23, 2007, the Department announced proposed changes to the Water Quality Management Planning rules that would be published in the May 21, 2007 New Jersey Register. The proposed rule amendments would:

- Establish clear standards for delineating appropriate sewer service areas to protect environmentally sensitive areas as well as clear, environmentally protective standards for the review of WQMP amendments
- Set forth clear standards to require identification of adequate wastewater management alternatives, address water supply, and control nonpoint source pollution (including controls related to stormwater, riparian zones and steep slopes)
- Reassignment of wastewater management planning responsibility to the County Boards of Chosen Freeholders to reduce WMP agencies to a manageable number and afford a regional approach to water resource planning
- Withdrawal of sewer service areas and re-designation as general wastewater service area of less than 2,000 GPD (septic) where the applicable WMP is not in compliance with the mandatory update schedule contained in the rules
- A requirement that municipalities pass an ordinance designed to assure septic maintenance
- A requirement that updated WMPs address septic density in a manner that demonstrates compliance with a 2 mg/L (ppm) nitrate planning target on a HUC 11 watershed basis, and
- Improve consistency with the State Development and Redevelopment Plan

Stormwater Management Rules (N.J.A.C. 7:8)

Guidance

Guidance for the development of Municipal Mitigation Plans was developed and made available in February 2006. Additionally, the Department developed guidance for the Special Water Resources Protection Area (SWRPA) Functional Value Analysis, which is required by the Stormwater Management Rules, of proposed encroachments into the SWRPA adjacent to all Category One waters, which requires a 300-foot buffer.

Administrative Order No. 2007-001 was signed by Department Commissioner, Lisa P. Jackson, on January 2, 2007, which made the Functional Value Analysis mandatory for any proposed encroachment into this 300-foot buffer. An applicant must demonstrate that the functional value and overall condition of the SWRPA will be maintained. In the absence of such a demonstration, encroachment into the SWRPA will be denied. The Functional Value Analysis and the Administrative Order are available at <http://www.nj.gov/dep/stormwater/>.

The Department is also pleased to provide guidance materials for municipalities authorized under the Tier A General Stormwater Permit (NJ0141852) and the Tier B General Stormwater Permit (NJ0141861). These guidance documents are to assist municipalities in complying with their Municipal Stormwater General Permit. Each municipality was mailed a compact disk (CD) containing all guidance materials needed to develop and implement a stormwater program.



Extended Detention Basin, Princeton Township, Mercer County

Compliance

As a result of much coordination among local governments in New Jersey, the Municipal Stormwater Regulation Program has completed its 2005 and 2006 survey of entities that discharge stormwater from municipal separate storm sewers (MS4s). According to the Municipal Stormwater Regulation Program 2006 Annual Report, 66% of municipalities adopted the municipal stormwater control ordinance. Coordination will continue to ensure even higher compliance rates.

The Department has made available an implementation schedule for Tier A and Tier B Municipalities to keep track of each Statewide Basic Requirement. The Effective Date of Permit Authorization (EDPA) for most municipalities is April 1, 2004. Therefore, this model timeline is based on that date.

Outreach

The Department will be conducting another series of stormwater workshops for 2007, which will include a brief update on the Municipal Stormwater Regulation Program and the Department's compliance efforts.

Open Space Preservation

The preservation of open space prevents some causes of NPS pollution by protecting those areas from development. The more developed a watershed becomes, the more paved surface, or impervious cover, there is within that watershed. Impervious cover has a direct and negative impact on the health of a watershed. This impact includes increasing the volume and the speed of stormwater runoff, increasing NPS pollutant loading and stream bank erosion rates. Consequently, a higher percentage of impervious cover generally results in a higher percentage of degraded water bodies. Preserving open space prevents this impact from occurring in the first place and so is a great preventative tool in controlling NPS pollution.

Green Acres Program

The Green Acres Program was created in 1961 to meet New Jersey's growing recreation and conservation needs. Lands that are acquired or developed with Green Acres funds must be used solely for recreation and conservation purposes.

As of December 31, 2006, Green Acres has preserved 613,978 acres since its inception. This includes open space lands the state directly purchased through Green Acres' State Land Acquisition Program as well as properties for which the program provided cost share funding through its Local and Nonprofit Assistance Program.

New Jersey's statewide system of preserved open space and farmland now amounts to over 1.3 million acres. Open space preservation and conservation is of inestimable value



in preventing and abating nonpoint source pollution and the Green Acres Program plays a pivotal role in New Jersey's nonpoint source control strategy.

The Department of Environmental Protection's newest purchase occurred on March 29, 2007 and included 288 acres of open space in Warren County. The Department and the New Jersey Natural Lands Trust purchased the property from private owners for \$3.3 million. The Trust

contributed \$824,450 using funds provided by the New Jersey Wetlands Mitigation Council, and DEP's Green Acres program contributed the balance of the purchase price through the State Land Acquisition program. The newly acquired land will expand a greenway that extends from Jenny Jump State Forest in Hope to Allamuchy State Park in Hackettstown. Located in Frelinghuysen Township, the site consists of forested wetlands and is ideal habitat for the state-endangered and federally threatened bog turtle. The newly preserved tract is also home to a number of rare plants including the state-endangered few flower spike rush and large water plantain. The New Jersey Natural Lands Trust will manage the property as part of its 300-acre Bear Creek Preserve.

Farmland Preservation Program

New Jersey reached a major milestone in October 2006 with the preservation of 150,000 acres of farmland. Almost one in every five acres of New Jersey farmland is protected from development - the highest rate of any state in the nation. The nearly 1,500 landowners who made the commitment to preserve their farms for future generations played a key role in this preservation accomplishment. Preserved farmland enhances the quality of life in New Jersey, the "Garden State", in so many ways, maintaining green and livable communities, providing seasonal habitat for native animals, helping towns hold the line on property taxes, and providing for a local, secure food supply.

New Jersey residents supported a constitutionally dedicated stable source of funding for farmland preservation. The State Agriculture Development Committee, which administers New Jersey's Farmland Preservation Program, is working toward a goal of ultimately preserving 600,000 acres to ensure an adequate land base for agriculture well into the future.

Additional Information

New Jersey Department of Environmental Protection
Division of Watershed Management
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(609) 984-0058
www.state.nj.us/dep/watershedmgt

APPENDIX I - TMDLs

NEW JERSEY TMDLS APPROVED BY EPA						
Federal Fiscal Year	Waterbody or Water Region	Parameter	Current Load (kg/yr unless indicated)	Target Load (kg/yr unless indicated)	% Reduction Required from Reducible Sources	Predominant Source: PS/NPS
2000	TMDLs Established Before 2003					
	Delaware River: Zones 2-5	VOCs (2 parameters)				PS
	Strawbridge Lake	TP	2162	787	67	NPS
	Sylvan Lake	TP	137.6	65.8	58	NPS
	Whippany River (2 TMDLs)	FC			58	NPS
	*Hackensack River	Ni	13.86 lb/day	4.88 lb/day		PS
2003	Northwest Water Region: 4 Eutrophic Lakes					
	Cranberry Lake	TP		400	85	NPS
	<i>Ghost Lake</i>	<i>TP</i>		33	<i>0 (protective TMDL)</i>	<i>NPS</i>
	Lake Hopatcong	TP		4800	42	NPS
	Lake Musconetcong	TP		2200	41	NPS
2003	Northeast Water Region: 3 Eutrophic Lakes					
	Lincoln Park Lake	TP		33	86	NPS
	Overpeck Lake	TP		850	90	NPS
	Verona Park Lake	TP		190	85	NPS
2003	Lower Delaware Water Region: 13 Eutrophic Lakes					
	Memorial Lake	TP		930	88	NPS
	Sunset Lake	TP		2500	92	NPS
	Bell Lake	TP		17	94	NPS

NEW JERSEY TMDLS APPROVED BY EPA						
Federal Fiscal Year	Waterbody or Water Region	Parameter	Current Load (kg/yr unless indicated)	Target Load (kg/yr unless indicated)	% Reduction Required from Reducible Sources	Predominant Source: PS/NPS
	Burnt Mill Lake	TP		290	91	NPS
	Giampietro Lake	TP		300	90	NPS
	Mary Elmer Lake	TP		380	91	NPS
	Bethel Lake	TP		540	85	NPS
	Blackwood Lake	TP		1200	88	NPS
	Harrisonville Lake	TP		500	92	NPS
	Kirkwood Lake	TP		380	84	NPS
	Woodbury Lake	TP		350	85	NPS
	<i>Imlaystown Lake</i>	<i>TP</i>		<i>390</i>	<i>0 (protective TMDL)</i>	<i>NPS</i>
	<i>Spring Lake</i>	<i>TP</i>		<i>11</i>	<i>0 (protective TMDL)</i>	<i>NPS</i>
	Raritan Water Region: 6 Eutrophic Lakes					
2003	Echo Lake	TP		140	93	NPS
	Davidson Mill Pond	TP		690	92	NPS
	Devoe Lake	TP		200	75	NPS
	Lake Manalapan	TP		1100	93	NPS
	Lake Topanemus	TP		110	82	NPS
	Round Valley Recreation Area	TP		64	46	NPS
	Atlantic Coastal Water Region: 9 Eutrophic Lakes					
2003	Deal Lake	TP		580	81	NPS
	Franklin Lake	TP		59	90	NPS

NEW JERSEY TMDLS APPROVED BY EPA						
Federal Fiscal Year	Waterbody or Water Region	Parameter	Current Load (kg/yr unless indicated)	Target Load (kg/yr unless indicated)	% Reduction Required from Reducible Sources	Predominant Source: PS/NPS
	<i>Hooks Creek Lake</i>	TP		12	0 (protective TMDL)	NPS
	Pohatcong Lake	TP		910	49	NPS
	Lake Absegami	TP		210	54	NPS
	Hammonton Lake	TP		210	81	NPS
	New Brooklyn Lake	TP		900	96	NPS
	Dennisville Lake	TP		240	83	NPS
	Lily Lake	TP		77	28	NPS
2003	Lower Delaware Region: 27 Streams	FC			86-99	NPS
2003	Raritan Water Region: 48 Streams	FC			69-97	NPS
2003	Atlantic Coastal Water Region: 31 Streams	FC			51-98	NPS
2003	Northeast Water Region: 32 Streams (34 Segments)	FC			37-98	NPS
2003	Northwest Water Region: 28 Streams	FC			47-99	NPS

NEW JERSEY TMDLS APPROVED BY EPA						
Federal Fiscal Year	Waterbody or Water Region	Parameter	Current Load (kg/yr unless indicated)	Target Load (kg/yr unless indicated)	% Reduction Required from Reducible Sources	Predominant Source: PS/NPS
2003	Delaware River: Zones 2-5 (4 TMDLs)	PCBs				PS/ NPS
2004	Clove Acres Lake and Papakating Creek					
	Clove Acres Lake	TP		2675.9	77	NPS
	Papakating Creek	TP		7190.9	31	NPS
2004	Cooper River Watershed: 4 Streams and 2 Lakes					
	Kirkwood Lake (from 2003 TMDL)	TP		380	84	NPS
	Evans Pond and Wallworth Lake	TP		532	92.9	NPS
	Cooper River Lake	TP		2110	89	NPS
	North Branch Cooper River	TP		693	88	NPS
	Cooper River Mainstem	TP		505	88	NPS
2004	Greenwood Lake	TP		3895	43	NPS
2004	Pequannock River: 9 Segments	Temperature		Passing flow, reservoir release temperatures and riparian restoration specified		NPS
2004	Wallkill River and Papakating Creek					
	WAL 1	Arsenic	7.3	0.030		NPS
	WAL 2	Arsenic	8.3	0.035		NPS
	WAL 3	Arsenic	3.4	0.041		NPS
	WAL 4	Arsenic	6.2	0.053		NPS
	WAL 5	Arsenic	10.8	0.126		NPS
	PAP	Arsenic	2.0	0.033		NPS
2005	Atlantic Coastal	FC			89-91	NPS

NEW JERSEY TMDLS APPROVED BY EPA						
Federal Fiscal Year	Waterbody or Water Region	Parameter	Current Load (kg/yr unless indicated)	Target Load (kg/yr unless indicated)	% Reduction Required from Reducible Sources	Predominant Source: PS/NPS
	Water Region: 2 Streams					
2005	Northwest Water Region: 10 Streams	FC			69-95	NPS
2005	Northeast Water Region: 2 Streams	FC			92-96	NPS
2005	Lower Delaware Water Region: 3 Streams	FC			80-98	NPS
2005	Raritan Water Region: 3 Streams	FC			46-98	NPS
2005	Swartswood Lake	TP		1461	57	NPS
	Swartswood Lake	Fish Community				
2005	Manasquan River Watershed: 2 Streams					
	Long Brook	TP		207.6	57.1	NPS
	Manasquan	TP		4392	61.3	NPS
2005	Atlantic Coastal Water Region: 3 Streams					
	Shark River-Tinton Falls	TP		244.4	54.1	NPS
	Shark River-Neptune	TP		464.3	73.7	NPS
	Metedeconk River	TP		358.4	84.9	NPS
2005	Northeast Water Region: 3 Streams					
	Coles Brook	TP		2566.41	46	NPS
	Pascack and Musquapsink	TP		5871.02	21.43	NPS

NEW JERSEY TMDLS APPROVED BY EPA						
Federal Fiscal Year	Waterbody or Water Region	Parameter	Current Load (kg/yr unless indicated)	Target Load (kg/yr unless indicated)	% Reduction Required from Reducible Sources	Predominant Source: PS/NPS
2005	Northwest Water Region: 7 Streams					
	Black Creek (2 segments) and Walkill	TP		1795	50	NPS
	Wawayanda	TP		5170	73	NPS
	Lokatong Creek	TP		1114	86.9	NPS
	Wickecheoke Creek (2 segments)	TP		3409	56	NPS
2005	Lower Delaware Water Region: 5 Streams					
	Barrett Run	TP		380	91	NPS
	Cohansey River (defer to Sunset Lake reductions)	TP		2500	92	NPS
	Big Timber Creek (defer to Blackwood Lake reductions)	TP		1200	88	NPS
	Oldmans Creek	TP		1874.5	80	NPS
	Blacks Creek	TP		1489.8	67.4	NPS
2006	Watershed Management Area 12: 5 TMDLS For Shellfish Impaired Waters					
	Manasquan River Estuary	Total Coliform		3.60E+15	77	NPS
	Navesink River Estuary	Total Coliform		1.26E+15	92	NPS
	Shark River Estuary	Total Coliform		1.20E+15	81	NPS

NEW JERSEY TMDLS APPROVED BY EPA						
Federal Fiscal Year	Waterbody or Water Region	Parameter	Current Load (kg/yr unless indicated)	Target Load (kg/yr unless indicated)	% Reduction Required from Reducible Sources	Predominant Source: PS/NPS
	Shrewsbury River Estuary	Total Coliform		2.42E+15	74	NPS
	Waackaack Creek-Tidal	Total Coliform		1.81E+15	34	NPS
2006	Watershed Management Area 13: 14 TMDLS					
	Barnegat Bay	Total Coliform				NPS
	Beaverdam Creek Estuary	Total Coliform		1.99E+15	41	NPS
	Cedar Creek Estuary-13	Total Coliform		1.38E+15	48	NPS
	Cedar Run-Tidal	Total Coliform		8.24E+13	75	NPS
	Manahawkin Bay	Total Coliform		9.01E+14	16	NPS
	Metedeconk River Estuary	Total Coliform		2.07E+15	87	NPS
	Mill Creek-Tidal	Total Coliform		2.67E+15	16	NPS
	Toms River Estuary(12)	Total Coliform		7.04E+15	74	NPS
	Tuckerton Creek Estuary(13)	Total Coliform		1.60E+14	86	NPS

NEW JERSEY TMDLS APPROVED BY EPA						
Federal Fiscal Year	Waterbody or Water Region	Parameter	Current Load (kg/yr unless indicated)	Target Load (kg/yr unless indicated)	% Reduction Required from Reducible Sources	Predominant Source: PS/NPS
	Westecunk Creek Estuary(14)	Total Coliform		1.01E+14	87	NPS
	Double Creek Estuary	Total Coliform		3.02E+15	50	NPS
	Forked River Estuary	Total Coliform		3.02E+15	50	NPS
	Kettle Creek-Tidal	Total Coliform		3.54E+15	23	NPS
	Oyster Creek Estuary	Total Coliform		3.02E+15	50	NPS
2006	Watershed Management Area 14: 5 TMDLS					
	Bass River Estuary	Total Coliform		3.10E+14	55	NPS
	Coastal Tributary to Great Bay	Total Coliform		4.51E+13	39	NPS
	Mullica River Upper Estuary	Total Coliform		4.63E+15	67	NPS
	Nacote & Mott Rivers Estuary	Total Coliform		1.01E+15	68	NPS
	Wading River Estuary	Total Coliform		5.91E+14	80	NPS
2006	Watershed Management Area 15 : 6 TMDLS					
	Absecon Bay	Total Coliform		1.26E+14	86	NPS

NEW JERSEY TMDLS APPROVED BY EPA						
Federal Fiscal Year	Waterbody or Water Region	Parameter	Current Load (kg/yr unless indicated)	Target Load (kg/yr unless indicated)	% Reduction Required from Reducible Sources	Predominant Source: PS/NPS
	Great Egg Harbor River Middle Estuary	Total Coliform		1.21E+16	46	NPS
	Great Egg Harbor River Upper Estuary	Total Coliform		1.21E+16	46	NPS
	Great Egg River Tidal	Total Coliform		1.21E+16	46	NPS
	Lakes Bay	Total Coliform		2.57E+14	94	NPS
	Reeds Bay	Total Coliform		1.15E+14	52	NPS
2006	Watershed Management Area 16: 10 TMDLS					
	Atlantic Ocean	Total Coliform		2.00E+15	71	NPS
	Bidwell Ditch-Tidal	Total Coliform		1.32E+14	74	NPS
	Cape May Canal	Total Coliform		2.00E+15	71	NPS
	Coastal Tributaries to Jarvis Sound	Total Coliform		2.00E+15	71	NPS
	Creese Creek Estuary	Total Coliform		1.83E+15	28	NPS
	Great Sound	Total Coliform		7.23E+13	68	NPS

NEW JERSEY TMDLS APPROVED BY EPA						
Federal Fiscal Year	Waterbody or Water Region	Parameter	Current Load (kg/yr unless indicated)	Target Load (kg/yr unless indicated)	% Reduction Required from Reducible Sources	Predominant Source: PS/NPS
	Jarvis Sound (formerly James Sound)	Total Coliform		2.00E+15	71	NPS
	Jenkins Sound	Total Coliform		1.83E+15	28	NPS
	Jones/ Stites/ Carino/ Taylor Creek Estuary	Total Coliform		2.00E+15	71	NPS
	Richardson Sound	Total Coliform		1.83E+15	28	NPS
2006	Watershed Management Area 17: 6 TMDLS					
	Cedar Creek Estuary-17	Total Coliform		4.47E+14	22	NPS
	Cohansey River Estuary	Total Coliform		2.46E+15	72	NPS
	Maurice River Estuary and Cove	Total Coliform		7.36E+15	78	NPS
	Middle Marsh Creek Estuary	Total Coliform		3.25E+13	22	NPS
	Nantuxent Creek Estuary	Total Coliform		2.43E+14	46	NPS
	Oranoaken Creek Estuary	Total Coliform		7.89E+11	47	NPS
2006	*Delaware River: Zone 6	PCBs				PS/NPS
*TMDLs established by EPA						

APPENDIX II - 2006 NPS Delistings

2006 303(d) LIST NPS DELISTINGS				
WMA	SUBWATERSHED	WATERBODY	STREAM MILES	DELISTED
05	Pascack Brook (below Westwood gage)	02030103170020-01	15.16	Fecal Coliform
05	Tenakill Brook	02030103170040-01	11.08	Fecal Coliform
18	Cooper River (above Evesham Road)	02040202110030-01	12.36	Fecal Coliform
11	Wickecheoke Creek (below Locktown)	02040105200060-01	17.46	Fecal Coliform
11	Wickecheoke Creek (above Locktown)	02040105200040-01	19.56	Fecal Coliform
05	Coles Brook / Van Saun Mill Brook	02030103180010-01	15.45	Fecal Coliform
01	Musconetcong R (I-78 to 75d 00m)	02040105160050-01	21.45	Fecal Coliform, Total Coliform
12	Whale Pond Brook	02030104090010-01	5.36	pH
18	Cooper River NB(above Springdale Road)	02040202110010-01	8.17	pH
08	Lamington R (Hillside Rd to Rt 10)	02030105050020-01	24.17	pH
10	Pike Run (below Cruser Brook)	02030105110100-01	17.78	Phosphorus
12	Manasquan R (Rt 9 to 74d17m50s road)	02030104100020-01	38.17	Phosphorus
03	Ramapo R (above 74d 11m 00s)	02030103100010-01	7.67	Phosphorus
01	Musconetcong R (below Warren Glen)	02040105160070-01	11.30	Phosphorus
09	Raritan R Lwr (Millstone to Rt 206)	02030105080030-01	12.48	Phosphorus
11	Plum Creek	02040105200050-01	7.90	Phosphorus
12	Manasquan R (gage to West Farms Rd)	02030104100050-01	11.17	Phosphorus
18	Big T Ck SB (incl Bull Run to Lakeland Rd)	02040202120040-01	11.77	Phosphorus

18	Oldmans Creek (Kings Hwy to Rt 45)	02040202160030-01	18.47	Phosphorus
12	Matawan Creek (above Ravine Drive)	02030104060020-01	17.02	Phosphorus
10	Stony Bk (Harrison St to Rt 206)	02030105090070-01	8.20	Phosphorus
19	Rancocas Ck NB (NL dam to Mirror Lk)	02040202020040-01	14.95	Phosphorus
03	Pequannock R (above Oak Ridge Res outlet)	02030103050030-01	18.02	Phosphorus
03	Pequannock R Charlotteburg to Oak Ridge)	02030103050050-01	29.32	Phosphorus
03	Pequannock R (below Macopin gage)	02030103050080-01	38.42	Phosphorus
01	Pohatcong Ck (Edison Rd-Brass Castle Ck)	02040105140030-01	20.03	Phosphorus
12	Jumping Brook (Ocean Co)	02030104090050-01	13.38	Phosphorus
02	Wallkill R/Lake Mohawk (above Sparta Sta)	02020007010010-01	16.14	Phosphorus
13	Metedeconk R NB (above I-195)	02040301020010-01	25.31	Phosphorus
02	Papakating Creek (below Pelletstown)	02020007020070-01	26.80	Phosphorus
03	Pequannock R (Macopin gage to Charl'brg)	02030103050060-01	16.46	Phosphorus, Dissolved Ox
08	Spruce Run (Reservoir to Glen Gardner)	02030105020020-01	6.34	Phosphorus, Fecal Coliform
08	Raritan R SB (Three Bridges-Prescott Bk)	02030105020100-01	38.41	Phosphorus, Fecal Coliform
11	Assunpink Creek (below Shipetaukin Ck)	02040105240050-01	16.20	Phosphorus, Total Coliform
02	Black Creek (below G. Gorge Resort trib)	02020007040020-01	31.32	Temperature
17	Cohansey R (incl Beebe Run to Hands Pond)	02040206080040-01	16.02	Temperature
12	Poricy Bk/Swimming R (below Swimming R Rd)	02030104070100-01	12.55	Temperature
12	Branchport Creek	02030104080030-01	7.30	Temperature
12	Waackaack Creek	02030104060050-01	21.52	Temperature
12	Navesink R (below Rt 35)/Lower Shrewsbury	02030104070110-01	28.53	Temperature, Dissolved Ox
12	Shark River (above Remsen Mill gage)	02030104090040-01	24.55	Total Coliform

12	Parkers Creek / Oceanport Creek	02030104080020-01	14.76	Total Coliform
12	Shark River (below Remsen Mill gage)	02030104090060-01	12.87	Total Coliform

APPENDIX III - Grant Reporting and Tracking System (GRTS) Reductions

GRTS NPS REDUCTIONS							
Project Number	Waterbody	Location	BMP	Nitrogen Reduction lbs/yr	Phosphorus Reduction lbs/yr	Sediment Reduction tons/yr	Funding Source
RP01-071	Cole's Brook	Hackensack	Riparian Buffers	5.7	2.9	3.4	319(h)
RP01-087	Cooper River Lake	Collingswood	Wetland Creation	208.6	98.2	105	319(h)
RP01-100	Woodbury Creek	Woodbury	Streambank & Shoreline Protection	12.8	6.4	7.5	319(h)
RP01-101	Dennis Creek Brook	Woodbine Borough	Streambank & Shoreline Protection	0.2	0.2	0.2	319(h)
RP02-075	Whippany River Watershed	Mendham Township	Water & Sediment Control Basin	322	160	160	319(h)
RP02-083	Van Saun Mill Brook	Bergen County	Riparian Herbaceous Cover	0.4	0.2	0.2	319(h)
RP03-009	Rancocas Creek Tributaries	Moorestown	Urban Grassed Swale	183	88	80	319(h)
RP03-010	Pompeston Creek	Cinnaminson Township	Streambank & Shoreline Protection	402.6	188.6	214.9	319(h)
RP03-017	Wallkill River-Glen Brook	Sparta Township	Riparian Buffers - Streambank Protection	13.5	6.8	5.9	319(h)
RP03-039	Powder Mill Pond	Franklin Township	Streambank & Shoreline Protection	21.9	11	11	319(h)
RP03-047	Mountain	Liberty	Oil & Grit	120	2	-	319(h)

	Lake & Mtn. Brook	Township	Separator				
RP04-003	Pequannock River	West Milford, Hardyston, Vernon	Riparian Buffers - Vegetative	15.3	7.7	9	319(h)
RP04-006	Bee Meadow Pond, Troy Brook	Hanover Township	Vegetated Filter Strips, Grass Swales	9,238	1,830	184	319(h)
RP04-013	Lake Alberta	Neptune	Oil & Grit Separator	3,036.2	347	109.4	319(h)

APPENDIX IV - Watershed-Based Plans

WATERSHED-BASED PLANS DEVELOPED 2002-2007					
RP #	SFY	Project Title	Anticipated Completion Date	Grantee	Amount (\$)
RP02-074	2002	Beaver Brook/Hibernia Brook Stormwater Management Plan	January 2006	Morris County Planning	74,840
RP02-085	2002	Delaware and Raritan Canal Tributary Assessment and NPS Management	Completed July 2005	New Jersey Water Supply Authority	61,215
RP04-001	2003	Swartwood Lake Regional Stormwater Management Plan	July 2007	Swartwood Lake and Watershed Association	65,000
RP04-005	2003	Regional Stormwater Management Plan for Troy Brook	March 2006	Rutgers Cooperative Extension	213,400
RP04-008	2003	Development of a Regional Stormwater Management Plan for the Raccoon Creek	December 2006	Camden and Gloucester County Soil Conservation Districts	637,174
RP04-010	2003	Regional Stormwater Management Plan for Robinson's Branch	March 2006	Rutgers Cooperative Extension	291,124
RP04-011	2003	Stormwater Management Plan for the Cedar Grove (Al's) Brook Watershed	March 2006	Franklin Township	150,000
RP04-016	2003	Watershed Restoration Plan for the Upper Salem River - Phase I	March 2006	Salem County Soil Conservation District	63,220
RP04-081	2004	Lake Characterization and Restoration Plan for Greenwood Lake, Passaic County, New Jersey	November 2006	West Milford Township	152,330
RP04-082	2004	Regional Stormwater Management Plan for the Deal Lake Watershed for the Purpose of Managing Existing and Future Stormwater Impact	July 2006	Deal Lake Commission c/o Borough of Allenhurst	99,400

RP06-071	2006	Modification to RP04-082 above - More funding granted.		Deal Lake Commission c/o Borough of Allenhurst	10,781
RP04-083	2004	Many Mind Creek Regional Stormwater Management Plan	October 2006	Atlantic Highlands Environmental Commission	87,833
RP04-084	2004	A Proposal to Prepare a Regional Stormwater Management Plan for the Sourland Mountain Watershed	November 2006	East Amwell Township	92,470
RP06-074	2006	Modification to RP04-084 above - More funding granted.		East Amwell Township	18,102
RP04-085	2004	A Regional Stormwater Management Plan for the Devils, Shallow, Cedar and Cranbury Brooks Watershed	July 2008	Middlesex Planning Department	286,200
RP04-086	2004	Posts Brook Regional Stormwater Management Plan	March 2006	West Milford Township	144,872
RP04-087	2004	Regional Stormwater Management Plan for Pompeston Creek, Burlington County, New Jersey	February 2007	Rutgers, The State University	249,570
RP04-088	2004	A Regional Stormwater Management Plan for the Pleasant Run Watershed	October 2006	Readington Township	52,560
RP06-065	2006	Modification to RP04-088 - More funding granted.		Readington Township	4,960
RP04-089	2004	Development of a Regional Stormwater Management Plan for the Upper Mantua Creek	July 2007	Camden County Soil Conservation District	503,065
RP05-079	2005	Watershed Restoration Plan for the Upper Cohansey River Watershed	February 2008	Rutgers, The State University	310,640
RP05-081	2005	Budd Lake Watershed Restoration, Protection and Regional Stormwater Management Plan	September 2007	Mount Olive Township	393,994
RP05-082	2005	Watershed Restoration and Protection Plan for Lockatong and Wickecheoke Creek Watersheds, Hunterdon County, New Jersey	February 2008	New Jersey Water Supply Authority	237,290

RP05-083	2005	Black Creek Watershed Restoration, Protection, and Regional Stormwater Management Plan (including the 9 minimum components)	September 2007	Vernon Township Department of Health & Human Services	385,674
RP05-084	2005	Watershed Protection Plan for the Alexauken Creek Watershed (including the 9 minimum components)	August 2008	West Amwell Environmental Commission	239,300
RP05-086	2005	Preakness Brook Restoration, Protection and Regional Stormwater Management Plan (including the 9 minimum components)	September 2007	William Paterson University	408,586
RP06-081	2006	Modification to RP05-086 above - More funding granted.		William Paterson University	30,655
RP05-088	2005	Watershed Restoration Plan for the Papakating Creek and the Surrounding Watershed (including the 9 minimum components)	September 2008	Wallkill River Watershed Management Group	168,850
RP05-090	2005	Watershed Restoration Plan for Clove Acres Lake and the Surrounding Lakeshed (including the 9 minimum components)	March 2008	Wallkill River Watershed Management Group	138,050
RP07-024	2005	Watershed Restoration Plan for the Upper Salem River Watershed (including the 9 minimum components)	January 2010	Rutgers, the State University	316,925
RP07-007	2006	Assiscunk Creek Headwater Restoration and Protection Plan (including the 9 minimum components)	April 2010	Burlington County Bridge Commission	362,230
RP06-068	2006	Neshanic River Watershed Restoration Plan (including the 9 minimum components)	October 2008	New Jersey Institute of Technology (NJIT)	435,715
RP07-016	2006	Mingamahone and Marsh Bog Brook Watershed Restoration and Protection Plan (including the 9 minimum components)	June 2009	Manasquan River Watershed Association	178,500
RP07-003	2006	Development of a Watershed Protection Plan for the Sidney Brook Watershed (including the 9 minimum components)	April 2010	Union Township Environmental Commission	237,362

RP07-001	2006	Tenakill Brook Watershed Restoration Plan (including the 9 minimum components)	August 2009	Rutgers Cooperative Research & Extension Water Resources Program	303,200
RP07-002	2006	Musquapsink Brook Watershed Restoration Plan (including the 9 minimum components)	September 2009	Rutgers Cooperative Research & Extension Water Resources Program	317,955
RP06-073	2006	Watershed Restoration and Protection Plan for the Musconetcong Watershed - Hampton to Bloomsbury (including the 9 minimum components)	October 2009	North Jersey Resource Conservation and Development Council, Inc.	297,191
N/A		Refined Phosphorus TMDL and Restoration Plan for Lake Hopatcong and Lake Musconetcong (CBT-funded)	October 2006	Princeton Hydro, LLC	94,000
N/A		Upper Rockaway River Priority Stream Segment Plan	January 2006	Rockaway River Watershed Cabinet	25,000
N/A		Wreck Pond CBT-funded Regional Stormwater Management Plan	December 2006	Monmouth County	350,000
RP06-069	2006	Demonstration Project to Support TMDL Implementation for the Pequannock River	December 2004	Pequannock River Coalition	24,500

APPENDIX V - Project Implementation

PROJECT IMPLEMENTATION INITIATED FROM THE APPROVED WATERSHED-BASED PLANS					
RP #	SFY	Project Title	Grantee	Amount (\$)	Funding Source
RP05-087	2004	Hurd Park Goose Management and Shoreline Restoration Project (goose management plan and implementation, approximately 3,000 linear feet of shoreline stabilized, approximately 1.5 acres of buffer installed)	Rockaway River Watershed Cabinet	210,000	319(h)
RP05-080	2005	*Implementation of Nonpoint Source Management Measures to Reduce the Phosphorus and Sediment Loads Entering Lake Hopatcong (installation of stormwater BMPs in Hopatcong and Jefferson) (Lake Hopatcong)	Lake Hopatcong Commission	844,500	319(h)
RP07-022	2006	Implementation of Golf Course Best Management Practices at Bey Lea Municipal Golf Course (construction of vegetative buffers along four in-line ponds) (Barnegat Bay National Estuary Program)	Ocean County College	290,490	319(h)
RP07-021	2006	Wetland Enhancement and Riparian Corridor Restoration at the Ocean County Vocational Technical School, Dover Township Campus (reestablishment of vegetative buffer and enhancement of previously disturbed wetland) (Barnegat Bay National Estuary Program)	Ocean County College	144,843	319(h)
RP04-001 MOA	2006	Swartswood State Park Implementation Project (parking lot retrofit to reduce runoff, including stormwater BMPs such as biofiltration islands)	Division of Parks and Forestry - Swartswood State Park	255,000	319(h)
RP06-069	2006	**Demonstration Project to Support TMDL Implementation for the Pequannock River (bypass of impoundment at Westbrook, project to address temperature impairment) (Pequannock River Temperature TMDL)	Pequannock River Coalition	24,500	319(h)
N/A	2006	Wreck Pond CBT-funded Stormwater Retrofit Project	Monmouth County	1,000,000	CBT
RP07-015 MOA	2006	Phase 1 Implementation Project from the Delaware and Raritan Canal Tributary Assessment and NPS Management Watershed Restoration and Protection Plan	New Jersey Water Supply Authority	175,000	319(h)

RP07-015 MOA	2006	Phase 2 Implementation Project from the Delaware and Raritan Canal Tributary Assessment and NPS Management Watershed Restoration and Protection Plan	New Jersey Water Supply Authority	175,000	319(h)
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- * The expansion of the sewer service area in Lake Hopatcong was halted due to treatment plant capacity and cost issues, pending finding a more feasible and cost-effective solution to the failing septic systems, which were identified as major sources in the TMDL.
- ** Regulatory implementation was also initiated by placing THE Pequannock River temperature and passing flow requirements, recommended by the TMDL, in the allocation permit.